THE ENGINEERING AND MINING JOURNAL

COAL

Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. L. AUGUST 16. NO. 7.

RICHARD P. ROTHWELL, C.E, M.B., Editor.

ROSSITER W. RAYMOND Ph.D., M.E. Special Contributor.

Cable Address: "Rothwell, New York." Use A. B. C. Code, Fourth Edition

London: 76 Finsbury Pavement, London, E. C., Mr. Thomas B. Provis, Civ and Mining Engineer, Manager.

Mexico: Mr. R. E. Chism, M. E., Callejon Espirito Santo No. 4, City of Mexico.

Peru, S. A.: Mr. John Newton, No. 2 Calle Constitucion, Calla.

Australasia: Messrs. Moffat, Judd & Co., 11 Bridge street, Sydney, N. S. W.; Mr. W. Forster, 56 Elizabeth street, Melbourne, Victoria; Messrs. J. T. Partridge & Co., 134 Manchester street, Christchurch, New Zealand.

SUBSCRIPTION PRICE, including postage:

Weekly Edition (which includes the Export Edition), for the United States, Mexico and Canada, $4 per annum; $2.25 for six months; all other countries in the Postal Union, $5.

Monthly Export Edition, all countries, $2.50 gold value per annum.

REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING CO. All payments must be made in advance.

THE SCIENTIFIC PUBLISHING CO., Publishers,

SOPHIA BRAEUNLICH, Sec'y & Treas. R. P. ROTHWELL. Pres. and Gen'l Manager.

P.O. Box 1833. 27 Park Place, New York.

CONTENTS.

	PAGE.		PAGE.
Applications for Machinery	185	Frost Proof Cement	195
Gambling in Pig Iron Warrants	185	A New French Canal	195
Misleading Prospectuses	185	Manganese Plating of Iron as a Protection from Rust	195
Co-Operative Dwelling Houses	185	Prevention of Breaking of Mine Timbers	195
Engineering Progress in the Orient	185	Durability of Pump Valves	195
The Railroad Strike	185	New Non-Conducting Material	195
Another Gold Amalgamating Process	186	The Use of Eucalyptus Fluid in Boilers	195
Accidents in Metal Mining	186	Corrosion of Zinc when in Contact with Brick	195
Statistics of Foreign Commerce	187	Production of Coal	195
The Manufacture of Aluminum at Pittsburgh	187	Protection of Mine Timbers from Decay	195
Census of the Slate Industry	188	Haase's System of Shaft-Sinking	195
*The Railway Tunnel Under the St. Clair River	188	The World's Mineral Wealth	196
Reverberatory Practice at Argo, Colo	189	A Luminous Buoy	196
A Coke Battery	190	Hard Steel Tinning	196
*Grabau's Method of Manufacturing Aluminum	191	The Sault Ste. Marie Canal	196
Death Rate in Austrian Mines	192	Electricity in Mines	196
*The Mineral Resources of Bolivia	192	Patents Granted	196
Steel Versus Wooden Railroad Ties	194	Personals. Obituary	197
The Mineral Wealth of Kulu	194	Industrial Notes	197
Gems and Precious Stones	194	Machinery and Supplies Wanted at Home and Abroad	197
Explosive Gas Detector	195		
Societies	195		
The Ericsson Submarine Gun	195		

* Illustrated.

MINING NEWS:	British Columbia 201	St. Louis 204	Pittsburg 205
Alabama 198	Canada 201	Pipe Line 204	FREIGHTS 205
California 198	Greece 202	MINING STOCK TABLES:	METALS 205
Colorado 198	Mexico 202	Baltimore 210	IRON:
Georgia 198	Nova Scotia 202	Birmingham 210	New York 205
Michigan 198	Syria 202	Boston 209	Chicago 206
Minnesota 199	MEETINGS 203	Coal Stocks 209	Louisville 206
Missouri 200	DIVIDENDS 203	London 210	Pittsburg 206
Montana 200	ASSESSMENTS 203	New York 209	IMPORTS AND EXPORTS 207
North Carolina 200	MINING STOCK MARKETS:	Pittsburg 210	CHEMICALS AND MINERALS 206
Oregon 200	New York 213	Paris 210	BUILDING MATERIAL MARKET 207
Pennsylvania 200	Boston 203	San Francisco 209	CURRENT PRICES:
South Carolina 200	Denver 203	St. Louis 210	Chemicals 210
South Dakota 200	Kansas City 206	Trust Stocks 210	Minerals 210
Tennessee 201	Minneapolis 203	MARKETS:	Rarer Metals 210
Utah 201	Salt Lake 203	COAL:	Building Mat'r. 210
Virginia 201	Lake Superior Gold and Iron Stocks 204	New York 204	ADV. INDEX xxi
FOREIGN:		Boston 204	
Africa 201		Buffalo 204	
Australia 201		Chicago 205	

THE number of applications for machinery and supplies in our free advertising columns, has already exceeded one thousand. Of these a large and fair proportion has resulted in business orders.

A BILL to stop gambling in pig-iron warrants has been introduced in the House of Commons by Mr. HINGLEY, Member of Parliament and president of the British Iron Trades Association. The bill recites that it is expedient to make provision for the restraining of the making of contracts for the sale and purchase by means of warrants of pig iron which is not at the time of the making of such contracts in existence, and decrees that any person who shall create or issue, or cause to be created or issued, any instrument purporting to be a document of title to pig iron, and shall not have at the time of such creation in his possession, or in the possession of some person on his behalf, the pig iron to which the said instrument purports to relate, shall be guilty of a misdemeanor and punished accordingly.

A COMMITTEE of the House of Commons has favorably reported the bill to fix more definitely the liabilities of directors for false or misleading statements in prospectuses. It provides that where a prospectus invites persons to subscribe for shares in or debentures of a company, every person who is named in the prospectus as a director or as having agreed to become a director of the company, and every person who has authorized or is responsible for the issue of the prospectus, shall be liable to pay compensation to all persons who shall subscribe, on the faith of such prospectus, for the loss or damage they may have sustained by reason of any untrue or misleading statement in the prospectus, or in any report or memorandum incorporated therewith or referred to therein, unless he proves affirmatively his non-liability according to certain rules laid down in the bill. If the bill passes, it should have an effect in making more difficult the floating in the London market of foreign wild-cat mining schemes.

IF the civilized portion of the human race were to vote upon the question, what is the next great labor-saving invention for which there is a long-felt want, no doubt a large majority would be in favor of an invention which would enable us to dispense with the servant girl. The invention has been made and patented, and is illustrated in the *Scientific American* of August 2d. It is an improvement in dwelling houses. Strange to say, the inventor, Mr. L. E. LADD, lives in Philadelphia, famed already as the city of dwelling houses. The improvement consists in a block of 24 or more buildings upon one lot of ground, each of which communicates through a passageway with another building in the center of the lot, which contains the general kitchen, laundry, supply rooms, heating and ventilating apparatus, electric light plant, etc. A dining room is built in the rear of each house, immediately adjoining the passage to the general kitchen. The central building would be connected with each of the houses in the block by a speaking tube or by telephone, whereby the housekeeper could order supplies in advance for each successive meal, the superintendent of the general supply building thus having the opportunity to buy in large quantities and better suit individual tastes. Like all co-operative schemes, the idea is a very attractive one, but it will need a capitalist with nerve to put up such a block of buildings and a good agent to induce people to live in them before it will be much of a success. The one that puts the idea in successful practice will be worthy of more credit than the inventor.

ENGINEERING PROGRESS IN THE ORIENT.

There are some evidences that the next field for great engineering and commercial enterprises will be in Western Asia. A railroad is projected from Joppa to Jerusalem, and the Sultan has issued an imperial irade to an English contractor for the construction of a railway from Damascus to the natural harbor formed by the Bay of Acre. It is believed that the projected line will divert into that country the considerable export trade of Syria and Arabia, and tap the rich agricultural district of the Hauran. The trunk line from Damascus to the sea will be 115 miles long, and the junction for the great caravan route to Mecca will be at Cæsarea Philippi, the ancient Dan.

The Turkish Government has also lately been considering the question of the possibility of navigating the Euphrates in all seasons. The engineers charged with the labor of investigating this point have completed their report, and have expressed the opinion that no very serious obstacle stands in the way of the project. The engineers estimate that the only works necessary would be the removal of the remains of old sluices, the diking of the fords and the destruction by means of dredges of the moving banks of sand stirred up by the current. The necessary outlay for these improvements would be half a million francs, without counting the cost of the floating material." It is proposed to raise this sum by proportional charges on the revenues of the imperial property in the vilayets of Aleppo, Mosul and Bagdad. The projected works will be the precursor of the great railway which must ultimately connect the Mediterranean with the Persian Gulf.

Russia is pushing its Siberian railway eastward with the intention ultimately of reaching Vladivostock on the Pacific. When these enterprises are completed, and it will be possible to go by rail from Calais to either Vladivostock or Calcutta, a great impetus will be given to the civilization of Asia.

THE RAILROAD STRIKE.

The shortness of the oft-mentioned step from the sublime to the ridiculous is nowhere more forcibly illustrated than in the modern strike. One cannot tell when the sensational affair begins, whether it is going to be awful or contemptible, or both. The strike of the Knights of Labor last week against the New York Central Railroad Company turned out to be an unusually conspicuous fizzle—one might almost call it a huge joke, of which the jokers have become, to their own surprise, the butt. Yet the stoppage of suburban passenger trains in the tunnels was no joke, and might easily have led to a tragedy; while the thought of the babies who may have sickened or died because the milk trains could not bring their accustomed food, suggests more forcibly still the reckless cruelty of the impotent outrage perpetrated by the Knights of Labor—the first Knights in history, we fancy, who have ridden rough-shod over infants.

This episode brings up again the familiar series of questions, to be debated for a day or two in the newspapers, and dropped until the next

strike. It emphasizes anew the extraordinary favor shown to wage-workers by the laws which permit them to combine freely and exert all conceivable influences short of actual violence, in order to raise wages, while combinations to maintain the prices of commodities are more and more extensively forbidden. It suggests once more the question whether the owners of property wantonly injured or the citizens wantonly put to trouble and expense have at present any legal remedy against the secret conclaves and the ignorant despots whose edicts wrought the harm. And it will doubtless strengthen the arguments of those moderate State-socialists who urge that such enterprises as railroads should be put in a separate category, and that the freedom of action, both of employers and of employed, should be curtailed in the interest of the public convenience and safety.

On the other hand, the quick collapse of this attack upon a great corporation shows that the evil of "sympathetic strikes," lately so portentous, and the power of the organization of which they are really the *raison d'être*, have been largely overcome without special legislative remedies by the operation of natural conditions and common sense. To that extent, it is perhaps a good argument for patiently letting things alone.

Apart from these considerations, the late strike brings up again the question of the attitude of large employers towards labor organizations. Mr. WEBB, whose cool, firm and energetic management, efficiently supported by Mr. VOORHEES and other officials of the road, has commanded universal admiration, plainly declares the position of his company. It makes no distinction among its men on the ground of their membership in any such organization. Only, it will not submit to the dictation of persons or committees outside of its own employés, or have with them any negotiations as to its business. This is really the "last ditch." Any further concession would render the conduct of business impossible.

Beyond question, the management of a great industrial or commercial enterprise might, with justice (we do not say with wisdom), refuse to employ workmen who were bound by secret oaths to sacrifice its interests whenever ordered to do so, for any purpose whatever, by an irresponsible outside power. And in the exercise of such a right of refusal, societies like the Knights of Labor, in which diverse trades are combined, might fairly be regarded as objectionable, even when trade unions proper were not.

Many manufacturers, for instance, have found a positive advantage in dealing with the intelligent representatives of trade unions, provided the latter are capable of making and keeping agreements. Such an organization, if confined to one *trade*, need not be confined to one *establishment* in order to make a tolerable *modus vivendi* possible.

Other employers, however, after repeated experiences of discord and disaster, have set themselves firmly against all organizations extending beyond the bounds of their own works.

There are, in fact, many gradations in this respect. But the one fundamental principle which must be satisfied is that of a contract. Whether such a contract be made with the individual workman, or with the workmen of a given department in a single establishment, or with a union of workmen in a given trade, is a minor consideration, compared with the vital necessity that, when made, it shall be kept.

The central evil and weakness of the latest operations of so-called "labor" is that they repudiate the conception of a contract, and substitute the ethics of war, according to which every agreement is only a temporary truce with the enemy.

The organization of the Knights of Labor, as it has been once more exposed, is fatally weak for either peace or war. Its supreme authority cannot prevent or stop a strike, or make an agreement binding upon its subordinate divisions; nor can these subordinate divisions make agreements which the supreme authority cannot overrule. There seems to be no power anywhere, except for mischief. The quicker this clumsy and impotent aggregation goes to pieces, the better for all parties. When such a pitiful burlesque of "organized labor" is once out of the way, the real and useful organizations can be treated with justice and respect.

ANOTHER GOLD AMALGAMATION PROCESS.

Another enterprising inventor has arisen who proposes to revolutionize the present gold amalgamation process. A published account says that "there is no doubt that Australian, South American and Californian mining operators will watch developments with intense interest"—as well they might, seeing that the inventor claims that by his process he can get from 70 to 90 per cent. of the gold contained in the rock, where the existing methods yield only about 50 per cent.

The process as described is evidently only applicable, if at all, to free milling quartz, on which it would be a queer sort of mill that would take out only half the gold. The inventor, like so many others who do not know what the mills are really doing, seems to have imagined a state of things which does not exist, and then proposes a remedy for this supposed necessity. Or perhaps he has confounded with free gold milling the losses where a large part of the gold was in the sulphurets and the latter not saved. Or possibly he has heard of rusty gold which will not amalgate, and supposes such to be the common order of things.

The invention appears to be a substitute for the plates, and the patentee is willing to let the stamps remain, though he expresses a preference for a machine which appears to be a Chili mill on a large scale. Our description goes on to say that "the machine which is to save so much gold is an iron disk, spinning in a shallow iron saucer full of mercury, on the surface of which the disk floats. In the middle of the disk is an iron hopper, through which the flow of water and crushed ore descends upon the mercury. The centrifugal force due to the rotation of the disk drives it from the center to the rim, pressing it down on the surface of the mercury all the time and insuring that every particle of gold shall be absorbed." All this is clear enough, but one may doubt, before seeing the machine at work, whether it will handle any very alarming amount of pulp on the "centrifugal" plan, though one machine is expected to treat ten tons per day. The assertion that the mercury practically lasts forever is also made.

There have been no end of devices for forcing the crushed ore through bodies of mercury from below, which would seem to be the simpler method, but they have gone the way of the famous lead bath scheme. Every such process, if well designed mechanically for exposing the pulp to the mercury, has been found to be extremely wasteful of the latter, and consequently of amalgam also.

Then follows in the printed description an account (which we do not understand) of some mysterious chemical action between some unnamed salts in "permanent connection with the mercury," the chemical solution being at one pole of an electric current, the quicksilver at the other. Electricity is generally invoked to help out metallurgical inventors nowadays; but this new method does not seem to greatly resemble the Wiswell process.

Why will not inventors of gold-saving processes first acquaint themselves with the working results of present practice before going into the business of revolutionizing? A great many failures are recorded in LOCKE'S two books on gold, in other treatises, in the reports of the government mining commissioners and in the technical press; but we fancy a compendium of the gold-metallurgy inventions as embalmed in the Patent Office reports might serve a useful purpose as a warning.

ACCIDENTS IN METAL MINING.

Dr. G. C. SWALLOW, in his last report as Inspector of Mines for Montana, lays stress upon a fact which is often lost sight of. Mining, that is, mining for gold and silver, copper and lead, is by no means so dangerous an occupation as is popularly supposed. Danger exists, and is always imminent, but the very fact that it is known to be ever present makes men cautious, and there is no question as to the earnestness of mine owners and managers to provide all safety appliances which experience shows to be useful, and to adopt the strictest sort of rules for the prevention of accidents. Any one who has seen the change shift at a great mine take their places in the queue, answer to the roll and step upon the cage with military precision and quietness, cannot fail to be impressed with the significance of the scene. Each man realizes that he is, in one sense, taking his life in his hands every time he enters the mine, and that not only must he himself exercise every precaution to protect himself from injury or death, but also that the lives and welfare of others depend on him; and, on the other hand, he has to trust to the coolness and steadiness of station bosses and enginemen. There is no crowding, no jostling, no unnecessary haste—certainly no confusion. Underground, the rule is the same. Each man is ever on the watch. If he is driving an upraise or working in an upper stope, he does not let fall his tools; if he is a blaster, he takes care that due warning is given; and, in short, no matter what a man's special occupation about a mine may be, he is constantly, unremittedly careful. The result of all this is that what would seem to be an extra hazardous pursuit, by virtue of the ever-present consciousness of danger and the carefulness which results from it, becomes about as safe as any other occupation.

Speaking of his own locality, Dr. SWALLOW remarks:

> The accidents in the mines of Montana for the last six months have been very few when compared with the many thousand workmen who are employed in them. These accidents have not been more numerous in proportion to the number of miners than are the accidents among railroad men, and lumbermen, and scarcely more than among teamsters and mechanics generally.

There is an indefinite number of possible causes of accidents in mines but for the Montana mines Dr. SWALLOW reduces them all to four groups:

1. The premature, the tardy, and the accidental explosions in blasting.
2. Exposure to impure air.
3. Being caught between the cage and the timbers of the shaft.
4. Being struck by caves and falling rocks.

As to explosions, Dr. SWALLOW justly says that

> From a long personal experience in the use of black powder and giant powder and dynamite in blasting, I say, without fear of contradiction by any competent authority on blasting, that all accidents of this kind are due to defective material, to a want of skill in using the materials, or to pure carelessness. There is no need of discussing the use of black powder, as that is no longer profitable in mining.

He then goes on to say:

> But cartridges of dynamite or giant powder, caps and fuse are now so accurate

made that the skilful workman can very nearly tell what effect any cartridge will produce, and can know how long any given length of fuse will burn; and nine hundred and ninety-nine caps in every thousand will explode the cartridge. If, therefore, the best cartridges, caps and fuse be used and they be kept in safe places where they can receive no injury, the skilful workmen need have no fear of accidents or want of proper results. If the hole be drilled of proper size and shape so the cartridge will slip in without serious abrasion or concussion, if the cap be well fitted to the fuse and both properly attached to the cartridge, there will be no premature nor tardy explosions and no failures. So that all the accidents of this kind are due to bad material, want of skill in their use or pure carelessness.

In metal mining, and especially mining for gold and silver, the second cause named—exposure to impure air—is usually a discomfort rather than a positive danger, and the instances when it becomes fatal, as in case of fire, are exceptional.

Accidents on the cage are almost invariably the result of sheer carelessness. Leaving out of account those which ensue from breaking of cable, overwinding, etc., the great bulk of casualties of this kind happens from neglect of ordinary caution. It is noteworthy that visitors to mines do not come to grief. It is always the men best acquainted with the workings who tumble down winzes or, absent-mindedly, ring the wrong signal. Careful as a miner may be, there comes a moment of forgetfulness, which is, perhaps, the critical moment for him. Yet, with all this, we believe Dr. SWALLOW to be correct in his idea that mining is not so hazardous as is often supposed.

Regarding accidents on cages, Dr. SWALLOW makes a suggestion which is worthy of consideration:

When a cage is crowded with men, the least movement or jostling is liable to prove instantly fatal to some one of the number by the rapid and irresistible motion of the cage itself.

It would seem as if any ingenious mechanic could make a cage safe with little expense and without detriment to its rapid use for other purposes than carrying men. I will suggest one method which will make the cage absolutely safe from such accidents with very little expense, and which will cause no delay in transporting the men and no detriment to its use for other purposes than carrying workmen in and out of the mine. Let a wire net or screen wide enough to close one side of the cage and as high as a man's head be coiled on a gas pipe fastened near the side and under the bottom of the cage, one on each side, to be drawn up as curtains are drawn down, and fastened to bars above, so that no one in the cage could possibly put out even a foot or hand so as to be caught by the timbers of the shaft. This screen and gas pipe on which it is coiled could be so attached to automatic springs that it would be coiled away the instant the cage reached the top or bottom or any desired station on the shaft. The cylinder or gas pipe on which the wire screen is rolled could be placed above and the screen be drawn down like a curtain instead of up, should it appear more desirable.

Such an arrangement would render any such accident and terrible mutilation impossible, would cost very little, would not in the least unfit the cage for any other use, and would cause no appreciable delay to the men in entering or leaving the cage.

Any good mechanic should be able to affix such an apparatus. While it might cause a little loss of time in manipulation, there can be no question that it would bring about practical improvement.

Falls of rock are apparently unavoidable, though accidents from this cause may be reduced to a minimum. The difficulty is that, as Dr. SWALLOW says, the miner can see but a small portion of a loose mass of rock, and often cannot estimate what danger exists. In metal mining, and especially in gold and silver mining, it is the practice to put in timber most liberally, and posts and stalls are added wherever a probability of danger is recognized. Notwithstanding all care in this respect, there will always and inevitably be accidents. But that they are not more frequent is very much to the credit of our mining system.

After all, the great safeguard against mining accidents is the ever-present realization of danger and the consequent habit of caution. On this ground alone some good mining men have gone so far as to condemn safety clutches and devices to prevent overwinding, thinking it better to trust to the watchfulness of the engineer than to any mechanism which is liable to rust and to fail just at the time—one instant out of hundreds of days—when it should come into play. There certainly is something in the idea; but, all the same, one would not like to give up the safety clutch.

STATISTICS OF FOREIGN COMMERCE.

The Chief of the Bureau of Statistics furnishes to the Secretary of the Treasury a preliminary statement of imports and exports for the fiscal year ending June 30th. The figures have been corrected down to July 21st, but are subject to some changes. The following is an abstract:

A comparison of the value of our foreign commerce of the last fiscal year with that of 1889 presents a gratifying increase. The total value of our imports and exports of merchandise attained the highest point ever reached by our commerce, amounting to $1,647,192,014 as against $1,487,533,027 during the fiscal year 1889, an increase of $159,658,987.

The value of our imports of merchandise, also, during the last fiscal year, was the largest in the history of our commerce, amounting to $789,335,855 as against $745,131,652 during the fiscal year 1889, an increase of $44,204,203. The greater portion of the increase in our imports of merchandise occurred in the following articles, named in order of magnitude of increase: Sugar and molasses; coffee; silk, raw and manufactures of; india-rubber and gutta-percha, crude; manufactures of cotton, vegetables and fruits. There was a decline in the value of our imports of raw wool, hides and skins, and iron and steel, and manufactures of.

The excess of exports over imports of merchandise during the last fiscal year was $68,520,304. Of our exports the value of domestic merchandise was $845,302,828, and of foreign merchandise $12,553,331.

The exports of merchandise amounted to $857,856,159 as against $742,101,375 during the fiscal year 1889, an increase of $115,454,784.

During the last fiscal year the value of our exports of domestic merchandise was $115,020,219 in excess of the value of such exports during the preceding year. The greater portion of the increase occurred in the following articles, stated in the order of magnitude of increase: Provisions, breadstuffs, raw cotton, iron and steel, and manufactures of; vegetable oils; unmanufactured tobacco; and wood, and manufactures of. Of this increase, $89,873,724 were in the value of exports of the articles named as follows: In exports of raw cotton, $13,190,974; in breadstuffs, $30,546,437; in provisions, $31,234,815; and in cattle, sheep, and hogs, $14,901,498.

IMPORTS AND EXPORTS OF MERCHANDISE.

Year ending June 30.	Total exports.	Imports.	Total exports and imports.	Excess of exports.	Excess of imports.
1870	$392,771,768	$435,958,408	$828,730,176		$43,186,640
1871	442,820,178	520,223,684	963,043,862		77,403,506
1872	444,177,586	626,595,077	1,070,772,663		182,417,491
1873	522,479,922	642,136,210	1,164,616,132		119,656,288
1874	586,283,040	567,406,342	1,153,689,382	$18,876,698	
1875	513,442,711	533,005,436	1,046,448,147		19,523,725
1876	540,384,671	460,741,190	1,001,125,861	79,643,481	
1877	602,475,220	451,323,126	1,053,798,346	151,152,094	
1878	691,865,766	437,051,532	1,131,917,298	257,814,234	
1879	710,439,441	445,777,775	1,156,217,216	264,661,666	
1880	835,638,658	667,954,746	1,503,593,404	167,683,912	
1881	902,377,346	642,664,628	1,545,041,974	259,712,718	
1882	750,542,257	724,639,574	1,475,181,831	25,902,683	
1883	823,839,402	723,180,914	1,547,020,316	100,658,488	
1884	740,513,609	667,697,693	1,408,211,302	72,815,916	
1885	742,189,755	577,527,329	1,319,717,084	164,662,426	
1886	679,524,830	635,436,136	1,314,960,966	44,088,694	
1887	716,183,211	692,319,768	1,408,502,979	23,863,443	
1888	695,954,507	723,957,114	1,419,911,621		28,002,607
1889	742,401,375	745,131,652	1,487,533,027		2,730,277
1890	857,856,159	789,335,855	1,647,192,014	68,520,304	

IMPORTS AND EXPORTS OF GOLD.

Year ending June 30.	Total exports.	Imports.	Excess of exports over imports.	Excess of imports over exports.
1870	$33,635,962	$12,056,950	$21,579,012	
1871	66,686,208	6,883,561	59,802,647	
1872	49,548,760	8,717,458	40,831,302	
1873	44,856,715	8,682,447	36,174,268	
1874	34,042,420	19,503,137	14,539,283	
1875	66,989,977	13,696,793	53,284,184	
1876	31,177,050	7,992,709	23,184,341	
1877	26,590,374	26,246,234	344,140	
1878	9,204,455	13,330,215		$4,125,760
1879	4,587,614	5,624,948		1,037,334
1880	3,639,025	80,758,396		77,119,371
1881	2,565,132	100,031,259		97,466,127
1882	32,587,880	34,377,054		1,789,174
1883	11,600,888	17,734,149		6,133,261
1884	41,081,957	22,831,317	18,250,640	
1885	8,477,892	26,691,696		18,213,804
1886	42,952,191	20,743,349	22,208,842	
1887	9,701,187	42,910,601		33,209,414
1888	18,376,234	43,934,317		25,558,083
1889	59,952,285	10,284,858	49,667,427	
1890	17,274,491	12,916,292	4,358,199	

IMPORTS AND EXPORTS OF SILVER.

Year ending June 30.	Total exports.	Imports.	Excess of exports over imports.	Excess of imports over exports.
1870	$24,519,704	$14,362,229	$10,157,475	
1871	31,755,780	14,386,463	17,369,317	
1872	30,328,774	5,026,231	25,302,543	
1873	39,751,859	12,798,490	26,953,369	
1874	32,587,985	8,951,769	23,636,216	
1875	25,151,165	7,203,924	17,947,241	
1876	25,329,252	7,943,972	17,385,280	
1877	29,571,863	14,528,180	15,043,683	
1878	24,535,670	16,491,099	8,044,571	
1879	20,409,827	14,671,052	5,738,775	
1880	13,503,894	12,275,914	1,227,980	
1881	16,841,715	10,544,238	6,297,477	
1882	16,829,599	8,095,336	8,734,263	
1883	20,219,445	10,755,242	9,464,203	
1884	26,051,426	14,594,945	11,456,481	
1885	33,753,633	16,550,627	17,203,006	
1886	29,511,219	17,850,307	11,660,912	
1887	26,296,504	17,260,191	9,036,313	
1888	28,037,949	15,403,669	12,634,280	
1889	36,689,248	18,678,215	18,011,033	
1890	34,854,711	21,986,657	12,868,054	

THE MANUFACTURE OF ALUMINUM AT PITTSBURGH.

The Pittsburgh Reduction Company, the only manufacturer of aluminum for commercial purposes in the United States, is, according to the Pittsburgh *Commercial Gazette*, preparing plans for the erection of an immense new plant. Several sites up the Allegheny and Monongahela rivers are now under consideration, and one is likely to be decided upon in time to begin work this fall. Nearness to the natural-gas or soft-coal fields is the most important requirement for the new site, and the one offering the greatest promise in this respect will be selected. It is proposed to erect a plant with 10,000 horse power, and to give employment to a large additional force of men.

Since the company began working under its process it has increased its capacity sixfold, until at present it occupies an ironclad building 75 by 175 feet on Smallman street. These works have a capacity of between 300 and 400 pounds of aluminum a day, but are now inadequate to supply the demand. The price has been reduced to $2 a pound. At present the Pittsburgh company imports from Germany the clay from which the metal is extracted. It is the intention, however, to make use of the raw material to be obtained in this country when the new works are constructed. Pittsburgh has supplied aluminum for the ornamental work, formerly made of nickel, in the cabins of the latest ocean steamers, and it has been adapted to the manufacture of table cutlery with success. The general use of the metal has only come into

prominence since the visit of the Pan-American deputation to Pittsburgh, on which occasion a special exhibit was made.

There are but six aluminum plants in the world, one in Pittsburgh and five in Europe. One of the latter, located near Manchester, England, began operations last month under the Pittsburgh company's patents. It has a capacity of about one ton of metal per week, and Pittsburgh and Allegheny City capitalists own a half interest in it. Negotiations are now in progress to sell the rights in four European countries. The consumption of the metal abroad has now reached such proportions as to justify the establishment of extensive works, and this will be done as soon as negotiations now pending in Pittsburgh are concluded.

CENSUS OF THE SLATE INDUSTRY.

The Census Office has very promptly issued, in the form of a bulletin, the statistics of the production of slate during the calendar year 1889, as prepared by Dr. William C. Day, special agent in charge of the statistics of stone.

This statement is said to be exact for the entire country, but is only a brief summary of the more important facts, which will be published in detail in the complete report.

The investigation was principally pioneer work. When it was begun eight months ago there was not even a good list of the producers of slate, and no investigation so complete as even the brief results now presented, had ever been successfully prosecuted. The following is an abstract of the bulletin.

The total value of all slate produced in the United States in 1889, as shown by the following table, is $3,444,863. Of this amount $2,775,271 is the value of 828,990 squares of roofing slate, and $669,592 is the value of slate for all other purposes besides roofing.

As compared with the statements of the Tenth Census report of 1880 on stone, the roofing slate product of 1889 is nearly twice as great in number of squares and in value. A consideration of the slate used for purposes other than roofing appears to have been omitted from the Tenth Census report. The total value of all slate produced in 1889 is more than twice as great as that considered in the Tenth Census.

As to the distribution of the quarries, twelve States at present produce slate. A line drawn on the map from Piscataquis County, Me., to Polk County, Ga., and approximately following the coast outline, passes through all the important slate producing localities. According to amount and value of product, the most important States are, in the order named, Pennsylvania, Vermont, Maine, New York, Maryland and Virginia. In the remaining six States productive operations are of limited extent, and in the case of Arkansas, California and Utah of very recent date.

Inasmuch as in slate quarrying the initial operations are those of stripping and excavating, preliminary to actual output, some time must necessarily elapse before any returns for labor can be realized. This explains why the expenses incurred in Arkansas, California and Utah exceed markedly the value of the output in those States.

The twelve States referred to do not include all those in which merchantable slate is known to exist, since discoveries promising good results for the future have been made in a number of other States, among which may be specially mentioned Tennessee. Red slate is produced only in Washington County, New York.

PRODUCTION OF SLATE IN THE UNITED STATES FOR THE YEAR 1889 BY STATES.

STATES.	Number of quarries.	Total value of all slate produced.	Total wages paid for entire product.	All other expenses in addition to wages.	Total expenses of producing entire amount of slate.
Arkansas	1	$240	$1,055	$3,240	$4,295
California	2	13,889	19,927	12,160	32,087
Georgia	4	15,330	11,371	2,180	13,551
Maine	4	214,000	160,300	16,800	177,100
Maryland	5	110,008	65,267	20,177	85,444
Michigan	1	15,000	12,000	(a)	12,000
New Jersey	5	10,925	7,367	1,760	9,127
New York	16	130,603	85,797	14,242	100,039
Pennsylvania	104	2,011,776	1,283,530	445,633	1,729,163
Utah	1	(a)	1,700	(a)	1,700
Vermont	60	838,013	494,110	87,806	581,916
Virginia	3	85,079	66,920	10,326	77,246
Total	206	$3,444,863	$2,209,344	$614,324	$2,823,668

STATES.	Capital invested.		Average number of employés.				
	In land.	Total capital.	Foremen.	Quarrymen and millmen.	Mechanics.	Laborers.	Boys under sixteen years.
Arkansas	$500	$610	1	2	1	3	(a)
California	57,200	70,000	2	15	(a)	10	(a)
Georgia	141,150	155,000	2	15	(a)	12	2
Maine	475,000	611,000	15	141	16	137	(a)
Maryland	257,550	374,000	6	109	10	44	13
Michigan	8,000	98,000	1	1	2	20	(a)
New Jersey	74,150	103,550	1	27	(a)	12	(a)
New York	185,200	296,180	13	154	2	37	2
Pennsylvania	5 019,157	6,823,902	134	1,725	200	1,243	265
Utah	18,000	20,000	(a)	(a)	(a)	4	(a)
Vermont	730,900	1,290,951	38	869	40	344	29
Virginia	57,684	170,000	6	94	2	89	25
Total	$7,034,491	$10,042,293	219	3,143	273	1,955	3

a None.

In regard to labor and wages, the slate quarrymen of the country, and to a considerable extent the firms operating the quarries, are either Welsh or of Welsh descent, many of them having learned the methods of quarrying slate in the celebrated quarries of Wales.

The quarries are operated on an average of about 220 days in the year. The idle days are the result of rainy weather and holidays. The first day of every month is regarded as a holiday by the Welsh quarrymen, and no work is ever done by them on Saturday afternoons.

The average wages for the entire country paid to foremen or overseers is $2.48 per day; for quarrymen and millmen, $1.56; for mechanics, $1.64; for laborers, $1.27, and for boys, 76 cents. The highest wages are paid in California, while those paid in the most important regions naturally approximate more closely the figures above given as the averages. The following figures represent the average daily wages paid in Pennsylvania: foremen, $2.25; quarrymen, $1.88; mechanics, $1.54; laborers, $1.40, and boys, 73 cents. In Vermont and New York region foremen receive an average of $2.65; quarrymen and millmen, $1.77; mechanics, $1.97: laborers, $1.51, and boys, 89 cents.

THE RAILWAY TUNNEL UNDER THE ST. CLAIR RIVER.

To cope with the steady increase of traffic over the Grand Trunk Railroad of Canada, and the Chicago and Grand Trunk, Detroit, Grand Haven and Milwaukee, and the Toledo, Saginaw and Muskegon railroads of the United States (practically one company) during the last few years, the steam car ferry now in operation has proved entirely incapable.

In view of the extreme flatness of the country, a bridge, high enough not to interfere with the navigation, would be impracticable. So the construction of a tunnel was decided upon, to extend between Port Huron, Mich., on the American side, and Sarnia, on the Canadian side. The St. Clair Tunnel Co. was formed in the year 1886.

In 1887 test shafts and tunnels on both sides of the river were completed, and attempts made to begin the work of the great tunnel by sinking large shafts; but the efforts failed, and the company proceeded to open horizontal cuttings to the required depth on each side of the river, and in the headings thus formed carry the tunnel through on the proper grades. Work upon the great cuttings was begun in January, 1889.

The walls of the tunnel are constructed of cast iron segments, 13 of which and a key form the circle. The dimensions of the cast iron segments are: Length, 4 feet 10 inches; width, 18 inches; thickness, 2 inches, with flanges inside 6 inches deep and 1¼ inches in thickness. These segments are cast with 32 holes in them, viz.: 12 in each side flange, and four in each end; they are secured in their places with bolts seven-eighths of an inch in diameter. The outside diameter of the tunnel is 21 feet, and 20 feet inside. The circle, taken by the bolts in the flanges, is 20 feet 5 inches.

The tunneling is being carried on by means of a pair of Beach hydraulic shields, one of which is employed in each heading.

This device is the invention of Mr. Alfred E. Beach, of the *Scientific American*, from which we abstract the present article, and was designed by him and tried in 1868 (patented 1869) for the purpose of excavating under the streets of New York, with a view to an underground railway.

The shield, the object of which is to protect the workmen while excavating the earth and building the tunnel, consists of a strong cylinder, of which the front end is sharpened, so as to have a cutting edge to enter the earth. The rear end of the cylinder, for a length of about two feet, is made quite thin, and is called the hood. Arranged around the main walls of the cylinder and longitudinal therewith is a series of hydraulic jacks, all operated from a common pump, each jack having cocks, whereby it may be cut off from the pump whenever desired.

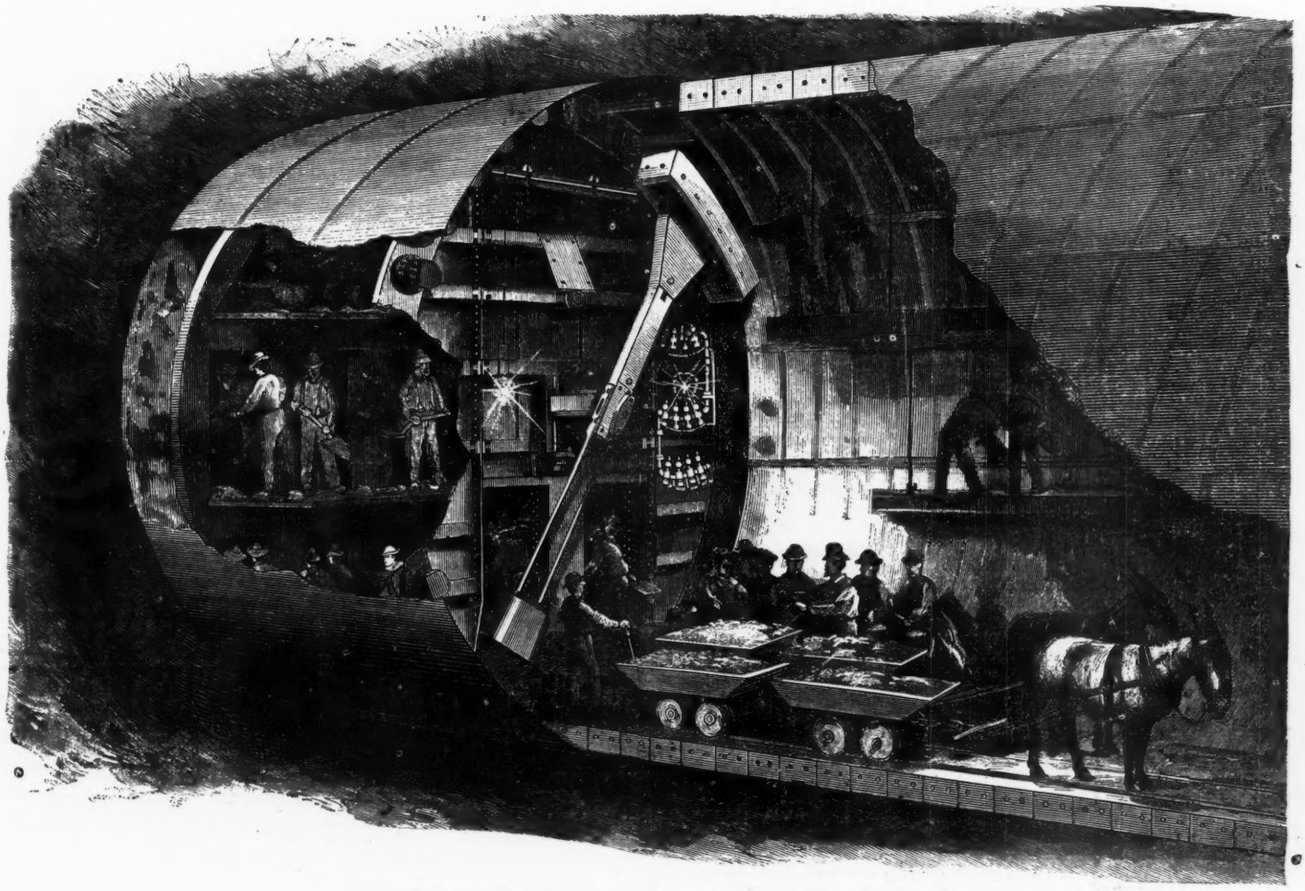
Within the shield are vertical and horizontal braces and shelves. When at work, the iron plates or masonry, of which the tunnel is composed, are first built up within the thin hood of the shield, the hydraulic jacks are then made to press against the end of the tunnel plates or masonry with the effect of pushing the shield ahead into the earth for a distance equal to the length of the pistons of the jacks, say two feet, or not quite the length of the hood, and as the shield advances, men employed in the front of the shield dig out and carry back the earth through the shield.

By the advance of the shield, the hood, within which the iron or masonry tunnel is built, is drawn partly off from and ahead of the constructed tunnel, thus leaving the space it occupied empty. The pistons of the hydraulic jacks are then shoved back into their cylinders, a new section of tunnel is built up within the hood as before, the shield is then pushed ahead, and so on. The extreme end of the tunnel is always covered and protected by the hood. In this manner the tunnel is built without disturbing the surface of the ground. By means of the system of hydraulic jacks capable of either combined or separate action, the direction of the tunneling shield can be governed with the utmost precision, and made to ascend or descend in the earth, according to grade required, or travel on a curve of any desired radius.

Each shield is circular, 21 feet 6 inches in diameter, 16 feet long, and is built of plate steel one inch thick. It is divided into 12 compartments by means of two horizontal and three vertical stays, which are built up to a thickness of two inches. These stays have a knife edge in front and extend back 10 feet, leaving six feet of clear cylinder, into which the end of the tunnel extends. Ten of the compartments are permanently closed and bracings of angle iron placed across them. The other two are provided with heavy iron doors, which can be closed at once in case of accident or danger. These doors are situated at the bottom in the center, and through them is passed all the excavated matter. Flush with this heading (with their cylinders extending forward into the compartments are 24 hydraulic rams at equal distances around the shield. These rams are eight inches in diameter and have a stroke of 24 inches. By their means the shield is forced forward enough to admit of another section of castings, viz.: 18 inches. Each of these rams can be worked separately. The power is supplied by a Worthington pump, which is capable of producing a pressure of 5,000 pounds per square inch, amounting to 125 tons per ram, or 3,000 tons on the 24 rams. The greatest pressure as yet used is 1,700 pounds per square inch, which is 40 tons per ram, and 1,060 tons on the shield. The shields weigh eighty tons each, and were brought to their destination in pieces and erected on the tops of the great cuttings, on the north side in both cases, where are also the machine and workshops erected in connection with this undertaking. The machine, when com-

pleted, was rolled down the side of the cutting on a wooden track composed of four rails of wood, each one foot square, and placed about four feet apart. It was restrained in its downward course by means of six large ropes, which were passed around it, fixed at one end to the upper end of the wooden track and coiled around piles, with a number of men to lower out when the order was given. From the time at which the machine first moved to the time it was resting on the cradle of wood prepared for it at the bottom, was only one hour and twenty minutes. When in position a backing of timbers one foot square was erected against the dead clay, and to this backing the first section of the tunnel was bolted, and others were added by means of a derrick on the American side. A similar backing was used on the Canadian side, with the exception that instead of having a solid back of clay as a support it had a number of shores.

The erection of the castings composing the tunnel is accomplished by means of a circular crane, which revolves on a spindle in the center of the shield, as shown in the illustration, and is provided with a vise at one end, with which to grip the casting, and a counterbalance weight at the other. When a casting has been made secure, the arm of the crane rises about nine inches, thereby shortening the vise arm and lengthening the counterbalance arm. This gives the cast-iron segment a clearance to travel around to the desired point, where it can be placed in position by reversing the sliding motion.



HYDRAULIC SHIELD AT THE ST. CLAIR RIVER TUNNEL.

The machinery plant, precisely similar on both sides of the river, comprises one boiler house, containing three boilers, two of which are kept in steam at a time; one machine shop, containing one planing machine, one drilling machine, and one bolt screwing machine. The planing machine is provided with an extra bed at each end, distant from the working bed about 2 feet. It is also supplied with an extra table. By this means the plane is kept almost incessantly at work, as while one table load is being planed, the other table is being unloaded and loaded again. When one lot is finished the table is run on to one of the extra beds, and the newly laden table on the other bed is placed on the plane. There is one carpenter shop, one smith shop, one electric light room, containing two dynamos and engines, a room containing blower engine and blower, a hoisting engine in another apartment, and a pump in the pit to pump out loose water.

The tunnel when completed will be 6,050 feet in length from cutting to cutting, and is divided as follows: From the American cutting to the river edge, 1,800 feet; from the Canadian cutting to the river edge, 1,950 feet; and the distance across the St. Clair River, 2,300. Of the 6,050 feet, 4,150 feet have already been constructed, viz., 2,215 feet on the American side and 1,935 on the Canadian.

The tunnel proper was commenced in August of 1889. It has so far exceeded all previous records of tunnel construction, and shows remarkably few accidents. The idea of building this tunnel of cast iron segment originated with Mr. Joseph Hobson, of Hamilton, Ontario, who is chief engineer of the St. Clair Tunnel Company, and also chief engineer of the Great Western Division of the G. T. R. of Canada. At a meeting of directors a short time since, Sir Joseph Hickson is reported to have expressed his belief that the tunnel would be completed for traffic within 18 months. Mr. Thomas Murphy, of New York, is superintendent of excavation.

The tunnel will, on the Canadian side, drain itself into the pump shaft, which is 18 feet in diameter and 112 feet in depth, and is being carried to the rock which lies at that depth.

The cost of this tunnel was originally estimated at $3,000,000, but is now thought to be a smaller sum. The amount of soil excavated amounts to 2,196,400 cubic feet, and will require 55,962,500 pounds of cast iron lining, secured together with 859,242 bolts seven-eighths inch in diameter. The tunnel construction furnishes employment for 700 hands.

REVERBERATORY PRACTICE AT ARGO, COLORADO.

Special Correspondence of the Engineering and Mining Journal, by Dr. E. D. Peters, Jr., M. E.

In my last letter I promised to describe some of the improvements that I saw at the Boston & Colorado Smelting Company's works at Argo, Colorado.

I cannot abuse Professor Pearce's kindness by going into details; but I am sure he will not object to a general description of these improvements, as he has referred to them himself in his presidential address to the American Institute of Mining Engineers at its Denver meeting.

The most important and noticeable improvement is the great increase in size and capacity of the reverberatory smelting furnaces. Only a few years ago a charge of 6,000 pounds was considered large, and 12 tons in 24 hours was considered good work.

I remember that in the Parrot works at Butte City, when, running on rich roasted concentrates, I reached 16 tons per furnace in 24 hours, I felt that I had got pretty near the limit of reverberatory capacity.

But the newest and largest reverberatory at Argo smelts the enormous amount of 30 tons of ore per 24 hours, averaging four charges of 15,000 pounds each, besides a certain amount of rich slag from other operations.

I am assured of the truth of this statement by Professor Pearce himself, who showed me the furnace slate on which the time and weight of each charge are recorded. And this result becomes still more extraordinary when we consider the charge that is smelted, and which consists of a mixture of dry and roasted ores, the majority of which is about as refractory as one can well get together anywhere. Silica predominates, while zinc and heavy spar are always abundant, and magnesia and alumina follow close behind. The only favorable feature is that the grade of the matte produced is much lower in copper than is usual in such western works as run solely for copper and aim to produce a matte of 60 per cent. and over. This is far less of a help in lifting the half-molten charge off the hearth of the furnace than is a matte lower in copper, and richer in sulphur and iron. The main product at Argo is gold and silver, and the ores smelted seldom average over 2 per cent. copper.

The concentration is unusually high, some 20 tons of ore producing only one ton of matte, averaging about 40 per cent. copper and varying in gold and silver according to the ore treated.

It usually assays 600 ounces in silver and 5 ounces gold to the ton. The very small quantity of matte produced would neutralize the advantages attendant upon its low grade in copper, were it not the custom to leave it in the furnace during four to six charges. Thus the fresh charge of ore falls directly upon the molten bath of matte, which prevents that obstinate sticking to the hearth that is the bane of all reverberatory smelting.

With so little sulphur in the ore, the amount of slag from an eight-ton charge is enormous, and if skimmed only through the front door in the ordinary manner, would take so long to be removed that the furnace would cool down excessively and much time and heat would be wasted.

Professor Pearce has therefore arranged matters so that the furnace is skimmed through the side, or charging-door, as well, and this reduces the time for the operation to the ordinary 10 or 15 minutes.

But the enormous amount of slag produced from these large charges would, if run into sand beds in front of the furnace in the customary manner, not only render the building unendurably hot, but take up too much space, and cost too much to remove.

This furnace, therefore, is equipped with iron slag-channels, cast in sections, and extending from the side door and front door to the anterior corner of the furnace, where they both empty into a cast-iron settling-pot in which any stray shots of matte are caught. An iron-spout, hinged at one end and counter-weighted, conveys the slag from this pot across the floor and through the front wall of the building to the dump outside. To make the entire operation automatic, the molten slag should here be granulated and removed by a stream of water, and elevated into cars. But this is impracticable at Argo, and the pigs of slag as soon as cool are loaded onto flat cars, which run alongside the dump, and are paid for by the railroad, being excellent for ballast.

I should have also mentioned that there is a settling-pot at each door, into which the slag is skimmed, and from which the cast-iron channels emerge. These channels require no fettling with clay, and last a long time without warping or cracking. The matte is tapped into iron molds and is thus obtained free from sand, while the disagreeable labor of raking the pieces of matte out of the hot sand and of making up the matte beds is entirely suppressed, and the furnace-house gains greatly both in space, cleanliness and comfort.

This enormous increase in capacity is brought about by a variety of improvements. Of course the principal factor is a considerable increase in both length and breadth of hearth. This is made larger than I ever believed it would be possible to heat rapidly to a smelting point. Whether a hearth of this size could be properly heated by wood still remains doubtful. I myself should not dare to risk it, though I propose this season to build some wood-burning reverberatories a good deal larger than have ever before been erected. But with coal the heat is entirely satisfactory; and though, of course, the fire-box is also somewhat enlarged, still the amount of coal consumed has not increased in proportion to the increase in ore smelted.

Another important factor is the careful heating of all the air admitted below the grate. This is accomplished by having tight doors to the ash pit, and passing the air that is to support combustion through various channels encircling the hearth and surrounding the fire-box. These are controlled by dampers, and the effect of this highly heated air on the combustion is exceedingly satisfactory.

Again, heated air is introduced through the roof, above the fire-bridge, by which the combustion of the gases is rendered much more perfect, as may be seen by watching the smoke through the chimney with and without the addition of this secondary air-current.

Again, much time is saved by charging the furnace through the roof, the entire charge being contained in two large sheet-iron hoppers. Over 20 minutes on each charge is saved, and much loss of heat is prevented.

Where the charge largely consists of roasted ore, and the arrangement of the plant permits, a marked increase in capacity may be obtained by dumping the red-hot ore from the calciners directly into the smelting furnace.

On the whole, the profession is deeply indebted to Professor Pearce for these improvements, and for his successful demonstration of what can be accomplished in reverberatory furnaces. I cannot yet desert the stand that I have taken in preferring blast furnaces to reverberatories under certain conditions; but I have to confess that the latter have encroached considerably on the field of the former during the past few years, and that I should now build a reverberatory plant in many places, where not long ago I should have unhesitatingly recommended the blast furnace.

Even now, for low-grade pyritous ores, where the charge is somewhat basic, there can be no comparison between the two. The copper-nickel deposits at Sudbury, Ontario, are a good example of the value of blast furnaces, for I do not think that those ores could be treated in reverberatories for twice the present cost.

Great improvements have also been introduced in the calcining department at Argo. A step-grate is used, and a grade of coal is thus made available that under ordinary circumstances could not be used in roasting. This coal is shoveled direct into large hoppers above the grates, and an occasional stir with a bar, and a slight removal of clinkers from the grates below, cause it to feed itself automatically as needed.

The general scheme of treatment of the Argo works *should* be familiar to all members of our profession; but the fact that I do not find one man out of ten who has any exact knowledge of this very complicated and interesting series of operations justifies me in skimming rapidly over the general features of the process.

Silver and gold ores are smelted together, producing, as already stated, a matte containing, say, 40 per cent. copper (or more), 600 ounces silver, and 5 ounces gold. This is variously handled, but is frequently crushed and partly calcined, and being resmelted with rich silicious ores, yields a *white metal* containing nearly 70 per cent. copper, and very rich in the precious metals.

This forms the main product of the *Ziervogel* treatment, and is crushed coarsely and calcined roughly in ordinary calciners. The product, consisting largely of oxide of copper, with some sulphates and many basic salts, is pulverized in a large Chili mill, and then goes to the Ziervogel calciners, where it is carefully roasted until all sulphates of iron and copper are decomposed and a maximum of sulphate of silver is formed.

This is by no means so difficult an operation as is supposed. Still, much of its success has hitherto depended upon the care and skill of the individual workman until the idea of adding an acid sulphate of soda was suggested. This salt holds on to its sulphuric acid till the last moment and at just the temperature required to sulphatize the silver, gives up half its acid, which thus forms an atmosphere of sulphuric fumes that aids greatly in sulphatizing the silver and correcting any irregularities of the operation. Owing to this discovery the percentage of silver now extracted from the matte is much higher and more regular than in former days.

The roasted matte is placed in wooden leaching vats, and the silver is rapidly dissolved by acidulated hot water. It is precipitated on copper plates as almost absolutely pure silver, and the copper is precipitated by iron as cement copper, which is melted and cast into plates to be used again in the same operation.

The residues of the Ziervogel process consist mostly of oxide of copper, containing a little iron, and quite a percentage of arsenic, antimony, bismuth, tellurium, and other impurities which abound in our Western ores.

The next step in the process is to get this copper back into the shape of a rich matte. To accomplish this, it is melted with pyritous ores rich in gold, but comparatively free from silver, as no silver is wanted in this matte that has passed the Ziervogel process.

This rich gold-copper matte is charged into a so-called blister furnace, in large lumps, and subjected to a slow melting and sweating heat with free admission of air. This rapidly oxidizes and removes the sulphur present, and as there was no more sulphur in the original matte than was just necessary to combine with the copper, it follows that on losing some of this sulphur a portion of the copper becomes metallic. When this has gone far enough, the entire charge is lapped into moulds, and under several of the first pigs of matte will be found the metallic copper that has been set free, and is known as bottoms. Metallic copper has a far greater affinity than matte for gold, as well as for arsenic, antimony, etc. Therefore, this small proportion of metallic bottoms has not only refined all the rest of the copper contained in the matte by dissolving up its arsenic, antimony, etc., but it has also practically removed all the gold from it.

The matte, now freed from gold, is once more crushed, calcined and treated by itself by the Ziervogel method, to remove the small quantity of silver still present, and the oxide residues are sold mostly to the bluestone manufacturers, who also regain what little silver and gold still remain.

The rich alloy of copper and gold is refined in a small furnace to remove the impurities already mentioned, and is then separated by a method well known to all metallurgists who interest themselves in such matters, but which I will not speak of, as the Argo authorities evidently prefer not to make it public.

This is a rough outline of one of the most complicated and ingenious series of metallurgical operations practiced anywhere, and that requires an unusual amount of care and skill to keep it in successful order.

No one is better qualified than Prof. Pearce himself to judge of the matter, but I have sometimes wondered if the simple method of matte separation practiced at Freiberg would not be more economical than this long series of difficult and expensive processes.

Why not simply calcine the first white metal and dissolve the copper oxide in dilute sulphuric acid, obtaining the copper as blue stone, and getting all the silver and gold that was in the matte, together with enough residue of lead to smelt them into a rich bullion, to be treated in the ordinary manner? The acid could be obtained at very slight cost from the iron pyrites used as flux, and which now only escapes into the atmosphere; and a very high grade of bluestone could be made, by using a portion of barytic ores to cleanse the white metal from all iron, as is practised in Freiberg. Any objection as to flooding the market is met by the fact (so I am told) that all the matte residues from these works are made into bluestone as it is.

TUCSON, Arizona Ty., August 1st, 1890.

A COKE BATTERY.

Written for the Engineering and Mining Journal by C. H. Aaron.

In 1886 I had the idea of substituting carbon for zinc in a galvanic battery. I thought that if coupled carbons were so exposed that the one should be oxidized in the wet way, the other not, a current would be developed, and as, in all batteries that I know of, the oxidized plate is the positive, I expected that it would be so in this case.

I made some experiments and, having had no opportunity of following the matter up, nor having been able to obtain any satisfactory opinion as to the value or meaning of my results from the several electricians to whom I applied, including Mr. Edison, I condense my notes made at the time for the benefit of whom it may concern.

I arranged an element consisting of the usual porous inner and impervious outer cell, and two pencils of coke with copper wires connected to their upper ends, also a decomposing cell with various electrodes, as required. My results were as follows:

Inner cell charged with solution of potassium permanganate and outer cell with plain water gave a good current, as was also the case when the outer cell was charged with solution of carbonate of soda.

The action soon ceased while the permanganate still retained color. On adding a little H_2SO_4, action was renewed, and the permanganate was quite decolored. If a piece of coke is placed in a solution of permanganate with some sulphuric acid added, decoloration of the liquid takes place but slowly: the action is vastly accelerated when the experiment is made in a porous cell and the coke is coupled with another piece in another liquid, whether that other liquid be neutral, acid or alkaline.

With permanganate and sodium carbonate, or simple water, action ceases in 24 hours, and is completely restored by heating, short of redness, the plate which is in the outer (soda, etc.) compartment.

Potassium dichromate, chlorate or tungstate, with dilute sulphuric acid, may replace the permanganate, also sulphuric acid or nitric acid, but the permanganate is the best. The dichromate was not completely decomposed. The coke plate which is exposed to the oxidizing liquid is in all cases *negative*, reversing my expectations. A single element charged as

above does not decompose water sensibly unless the water has salt or acid, etc., added to it; but three elements decompose water alone.

The coke in the outer compartment (the inner one containing the oxidizing liquid) is not essential, though the most convenient conductor; a finger placed in that compartment enables the current to be felt on touching the tongue with the wire from the other; a piece of wet cloth dipping in the outer cell and furnished with a terminal of platinum gives good results in the decomposing cell. The coke in the porous cell cannot be thus substituted, which seems to prove that the current is not solely due to the different liquids, and to indicate that the coke is actually oxidized, which Mr. Edison has doubted; yet I was not able to detect CO_2 in the small quantity of gas evolved from this plate; perhaps it was CO, but it must be remembered that my apparatus was of the roughest, I being in Arizona. I was in hopes of finding an oxidizing solution which could be regenerated by passing air through it, which would make the battery very inexpensive, but did not succeed. Even tungstic acid, which can be reoxidized by simple exposure to air after its reduction by zinc, fails after having been deoxidized by coke; but this important point requires further investigation. Thus far the action of my battery was not quite satisfactory; it would cease before the permanganate was quite decomposed sometimes in the course of 24 hours; I therefore tried other solutions in the outer cell, as follows:

Beginning with water in the outer cell, I tried successively solutions of sodium carbonate, caustic potassa, acidulated brine, ammoniated brine, etc., and at last potassium and calcium polysulphide, which gave a much stronger current and continuous action, while charge after charge of permanganate was completely decomposed in the porous cell. The polysulphide in the outer cell did not seem to suffer much from the action of the air on its surface, which, however, I partly prevented by means of a cover. The current was now able to decompose plain water with a single element, yet three elements failed to give a secondary current with the helix of a Kidder's medical battery.

Two cells charged with potassium permanganate and dilute H_2SO_4 in the porous compartment and potassium polysulphide in the other, a plate of coke in each, gave 3·8 grains of precipitated copper in three hours, and 20 grains potassium permanganate gave 10·2 grains copper; 20 grains bleaching powder, 3·6 grains copper; 20 grains potassium dichromate, 9·6 grains copper. The coke plates had about 9 square inches of surface exposed to the oxidizing solution.

GRABAU'S METHOD OF MANUFACTURING ALUMINUM.

By M. Iohon.*

Impurities even in very small proportions modify essentially the properties of aluminum, especially its resistance and unchangeableness. It is only with great difficulty that cryolite containing a little amount of iron and silicon gives relatively pure aluminum; the poorer the material, down to clay, the greater the obstacle.

By the process exhibited at the exposition last year in Paris, Messrs. Bernard Bros., of Creil, claimed the cost price to be only 10 francs per kilogram (about 90 cents per pound) or about the same as that claimed for the Grabau system. This is remarkable for the purity of the product, reaching 99·80 per cent., whilst the English and Shaffhausen mills reach between 96 and 98·50 per cent., and the Salindres factory 98·90 per cent.

The Grabau process includes in the first place the manufacture of fluoride of aluminum by means of sulphate of alumina, fluorspar and cryolite, the last of which, however, in its natural state is only used at the commencement of the operations, the reduction of fluoride of aluminum giving much purer artificial cryolite. In the second place, fluoride of aluminum is reduced by sodium, which M. Grabau claims to make at a very cheap rate.

As to the manufacture of fluoride of aluminum, from 10 to 13 per cent. of sulphate of alumina is dissolved in water and the solution is treated with fluorspar pulverized and as pure as possible; the mixture is heated for several hours at 60 degrees C. in a basin supplied with a kneader. Within a short time the fluorspar is partly decomposed and forms sulphate of lime. A repetition several times of this operation can substitute fluorine for as much as 66 per cent. of sulphuric acid combined with alumina; practically, however, it is advantageous to stop at 55 per cent., when a special combination is formed of fluoride of aluminum and sulphate of alumina, a fluosulphate of alumina, $Al_2(Fl_4SO_4)$. The solution is left to settle for several hours and is then, while still not clear, transferred to a large wooden reservoir; the precipitated sulphate of lime is washed on filters, and the water filtered off is used to dissolve a new quantity of sulphate of alumina, the sulphate of lime retaining only 3 per cent. of the sulphate of alumina, which has now become insoluble.

The solution of fluosulphate which is not clear, owing to the presence of the basic silicates generated from the sulphate of alumina, is subjected to a treatment with cyanide of potash, in order to remove small particles of iron and is then filtered. The fluid when thus made transparent contains fluosulphate and sulphate of alumina, as well as small quantities of sulphate of soda generated from sulphate of alumina, and small quantities of sulphate of lime, one cubic meter of the fluid containing one kilogram of lime.

Evaporation in the water-bath makes the consistency of the fluid like that of syrup; the vapors are removed by two ventilators, one of which acts by suction, while the other blows in purified air through a cotton-filter, so as to prevent the dust in the atmosphere from entering

Finely pulverized cryolite is then added, and thorough mixing takes place in a kneader. The proportion of cryolite added must be such as to secure a complete absorption of the sulphuric acid still combined with the alumina, by the sodium of cryolite in exchange for the fluorine of the latter.

The mixture is put in a vessel of lead and dried at about 150 degrees in a drying room. The porous matter obtained is broken into pieces of the size of small nuts. To substitute fluorine for sulphuric acid the substance must be heated to a dark redness in a pan in whose lining iron and silicon do not occur, and which, when pushed in, is held in a muffle heated to redness. To facilitate the subsequent washing, melting should be avoided. The object of the washing is to remove the sulphate of soda and to leave the fluoride of aluminum.

The preparation of the last is thus seen to comprise two phases: the first assuring an exchange of a part of sulphuric acid for the fluorine from the fluorspar, the second exchanging the remainder of the sulphuric acid for the fluorine from the cryolite. The natural cryolite used at the start is afterwards replaced by artificial cryolite produced during the reduction of the fluoride of aluminum.

Repeated washing in hot water of the mixture of sulphate of soda and fluoride of aluminum removes with the former 15 per cent. of the latter, together with the larger part of the iron. The 85 per cent. of fluoride of aluminum left is then pressed, made into cakes, dried and broken into pieces of the size of nuts.

The reduction of fluoride of aluminum by sodium takes place in a smelting vessel, whose diameter is equal to its height, and which is lined with a layer of cryolite several centimeters thick, or, still better, with bricks made of pulverized cryolite and moistened with a solution of sea salt.

The fluoride of aluminum is preferably heated to redness in an iron cylinder lined with a fireproof material without any silicon and iron. The cylinder is closed with an iron lid; its bottom, movable around an axle, is held in position by a counterweight. The fluoride of aluminum does not smelt, and evaporates very little, provided the cover closes tightly.

A small wagon on rails brings the reduction vessel under the cylinder containing the fluoride; this is dropped in and the vessel instantly removed in order to receive a bar of sodium heated to a temperature near the point of fusion; then a cover of asbestos is immediately put on and a very lively reaction sets in at once with strong seething, and an occasional outburst from under the cover of sodium flames.

When the proportions of sodium and of fluoride of aluminum have been selected so as to reduce only about half of the latter, the other half combines with the fluoride of sodium product and forms cryolite. After the reaction, which only lasts some moments, the latter forms a perfectly smelted mass at a temperature far higher than that of the original mixture. After cooling, the solidified cryolite is found to cover a residuum of metallic aluminum, topped off with a light crust of cryolite from the lining.

The slag of fluoride of aluminum, when prepared with natural cryolite, which always contains silicon, is gray or very dark, whilst perfectly white in this process.

What distinguishes this process is that an accessory product from one operation is re-used as raw material in a subsequent operation, and that thereby the quantity of natural cryolite necessary at the start is greatly limited.

If no losses were involved in the manufacturing on the supposition that all the sulphuric acid of the sulphate of alumina was eliminated in the agglomeration with the cryolite, only such quantity of cryolite would at the time of reduction be produced which is theoretically necessary for the production of fluoride of aluminum according to the two formulas:

$$(1)\ Al_2(SO_4)_3 + 6\,NaFl,\ Al_2Fl_6 = 2\,Al_2Fl_6 + 3\,(Na_2SO_4).$$
$$(2)\ 2\,Al_2Fl_6 + 6\,Na = Al_2 + 6\,NaFl,\ Al_2Fl_6.$$

But owing to the losses incurred by washing, etc., the quantity of cryolite would be insufficient.

If, on the other side, in the treatment of the sulphate of alumina by the fluorspar the theoretical limit of reaction were attainable, twice the quantity of cryolite necessary for making fluoride of aluminum for the following operation would be obtained; in fact, one would get

$$(3)\ 3\,Al_2\left\{\begin{matrix}Fl_4\\SO_4\end{matrix}\right\} + 6\,NaFl,\ Al_2Fl_6 = 4\,Al_2Fl_6 + 3\,Na_2SO_4.$$
$$(4)\ 4\,Al_2Fl_6 + 12\,Na = 4\,Al + 2\,(6\,NaFl,\ Al_2Fl_6).$$

The losses entailed by washing would, however, reduce the excess of cryolite from 100 to 83 per cent.

Supposing that only 50 per cent. of the sulphate of alumina are transformed, there would still, despite the losses from washing, be an excess of cryolite amounting to 35 per cent., as the following formula:

$$(5)\ \left\{\begin{matrix}Al_2(SO_4)\\Al_2Fl_6\end{matrix}\right\}^3 + 6\,NaFl,\ Al_2Fl = 3\,Al_2Fl + 3\,Na_2SO_4$$
$$(6)\ 3\,Al_2Fl_6 + 9\,Na = 3\,Al + \frac{3}{2}(6\,NaFl,\ Al_2Fl_6).$$

As already mentioned, 55 per cent. of the sulphate of alumina is readily transformed; the process will consequently always give a sensible excess of artificial cryolite useful in glass-making. The purity of the aluminum depends of course on the purity of the material, where absence of iron and silicon is of prime importance.

The solution of fluosulphate of alumina which serves to prepare the fluoride of aluminum has no trace of silicon, and if the sulphate of alumina, which can be purchased in chemical factories, and the fluorspar are free from iron, the fluosulphate will also contain none; the iron can at any rate be precipitated by yellow cyanide of potash.

The natural cryolite contains always up to five per cent. of quartz and 0·5 per cent. of iron. Evidently the fluoride of aluminum obtained in the first operation must be impure as well as the aluminum resulting of its reduction. The artificial cryolite obtained at the same time can be freed from its iron by a diluted acid, and the silicon disappears in the state of fluoride of silicon when the fluosulphate is heated red. The fluoride of aluminum obtained in the subsequent operation is perfectly white and the products remain pure, if no impurities enter from without. At the time when the solution of fluosulphate and sulphate of alumina evaporates, the greatest precautions are taken in that direction.

During the reduction of fluoride of aluminum this requirement is facilitated by the fact that fluoride of aluminum does not melt at red heat; only the lining of the walls of the cylinder in which it is heated must contain no iron and silicon.

The cryolite lining of the reduction vessel is hardly attacked by the heat, the reaction being too rapid; no increase in temperature is felt on the outside of the walls.

The exceptional purity of the aluminum made by the Grabau method is attested by the following two assays made in the assay depart-

* From *Annales des Mines*. Translated for the ENGINEERING AND MINING JOURNAL.

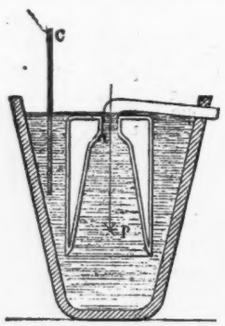
ment of l'Ecole des Mines; 1 is of aluminum made by means of natural cryolite; 2, by means of artificial cryolite obtained in the third reduction.

	1	2
Silicon	1·12	0·06
Iron	3·71	0·17
Manganese	0·21	trace
Aluminum	94·96	99·77
	100·00	100·00

The cheapness of the product depends on the electrolytic process of making sodium, which Mr. Grabau claims to be able to manufacture at from 1½ to 2 francs per kilogram (14 to 18 cents per pound), or about $\frac{1}{10}$ of the current price at present.

As several patents have not yet been taken out, this porcedure can only be sketched. Its basis is the decomposition of smelted sea salt by an electric current.

The salt, specially prepared, is placed in a crucible in which are suspended. as shown in the figure, a carbon electrode, *c*, on which the chlorine is being disengaged, and a reversed bell of porcelain with double walls and a metallic frame; between the walls is an insulating layer of air. The other electrode. made of iron wire, is attached to the metallic frame in the bell, and ends in a star *p*. The double wall is necessitated by the current's rapid deterioration of single wall. At the upper part of the bell where the opening is tube-shaped, *t*, a rectangular iron-tuyere conducts to a vessel filled with petroleum or nitrogen the drops of sodium which rise to the surface because of their smaller specific weight.



The porcelain is only faintly attacked by the incandescent sodium even at a far higher temperature than that of smelting, owing to to the particular conditions in which the sea salt is placed, and without which the porcelain would be totally destroyed within a few hours.

Chloride of sodium is filled in as the gradual disengagement of the sodium lowers the level of the smelted salt; the sodium obtained is perfectly pure, and in no need of re-smelting.

To summarize the description, we put in juxtaposition the chief features of this and of Deville's method.

Mr. Grabau uses as first material sulphate of alumina, fluorspar and artificial cryolite. The humidity makes it possible to obtain a perfectly pure fluoride of aluminum, while it is far more difficult to get a pure chloride of aluminum. Besides, the latter is rapidly decomposed in the air, and must be employed with no delay, whereas the fluoride can be kept without change.

The old Deville process uses as first material chloride of aluminum, sea salt and natural cryolite; the first of these is reduced by sodium in the presence of a solvent in fireproof furnaces. The material of these being attacked by the fusion, the aluminum becomes impure. The useful effect of sodium hardly exceeds 76 per cent. of the theoretical. The reaction is relatively feeble since the mass contains a smaller proportion of aluminum than in Grabau's, and it is attempted to reduce all this aluminum.

In the latter's method the reduction takes place without solvent and is conducted so as to extract from the fluoride only half the aluminum it contains; the reaction is very intense; from 83 to 90 per cent. of the sodium is utilized, which, with one part of the fluoride of aluminum produces cryolite at the same time as it reduces the other part. The reaction is accompanied by a considerable increase in heat so that it can take place in a cold vessel lined with cryolite and the introduction of impurities in the aluminum thus be avoided.

Finally the two methods differ in their modes of obtaining sodium.

Mr. Grabau claims that the following figures represent the cost of making aluminum, inclusive of that of sodium, on a scale of 20 kilograms in 24 hours, an increase in which would amply reduce the price.

Investment.	Francs.
Buildings	57,000
Steam engine, boiler, dynamo	35,000
Electric apparatus for making sodium	22,000
Sundry apparatus	25,000
Working capital	40,000
	179,000

Working Expenses.	Francs.
Labor per day	40·00
Chemists	40·03
Fluorspar	12·00
Sulphuric acid	2·50
Sulphate of alumina	60·00
Sea salt	36·00
Various chemical products	16·00
Coal	50·00
Repairs and sinking fund	30·00
	286·50

or about 14·30 francs per kilogram.

Death Rate in Austrian Mines.—Official statistics of casualties in Australian mines show that the proportion of fatal accidents amounts to about two per 1,000 lives. For the years 1879-89, inclusive, there were 1,838 deaths among miners, averaging 167 per annum. The average number of workmen employed was 82,312.

THE MINERAL RESOURCES OF BOLIVIA.

By John B. Minchin, Oruro.*

The short coast line which Bolivia originally possessed on the Pacific was lost during the late war with Chili, leaving it thus completely shut in, while the commerce passing through Peruvian, Chilian, Argentine or Brazilian ports, is credited to one or other of those countries.

This want of direct communication with the outer world naturally retarded progress, while the absence of industrial enterprises left the inhabitants at leisure to engage in those constant petty revolutions to which the country was a prey for half a century after the War of Independence. The more enlightened governments of later years have done much to improve matters, while the approach of the Peruvian and Argentine railways on the north and south, and above all, the construction recently of a narrow gauge line from the port of Autofagasta to the Huanchaca silver mines and its projected extension to other mining centers are producing a most beneficial effect.

Owing to its great variety of altitude and climate, Bolivia is almost unique as regards its natural resources. A cross-section of this part of the South American continent presents, on leaving the pacific, a more or less rapid ascent for some hundred miles, when an elevation of from 12,000 feet to 14,000 feet is met with on the western border of the Bolivian tableland; this latter extends eastward for 200 miles, and is succeeded by an extremely rugged and mountainous region measuring 300 miles across, through which wind innumerable tributaries of the Amazon and the River Plate; still further east, vast forest plains and "pampas" stretch without interruption to the boundary of Brazil.

These eastern plains, at an elevation of only from 500 feet to 1,200 feet, are purely tropical, the high tableland possesses a cold, dry climate, while the intermediate mountainous region presents every gradation of temperature between the two extremes.

As is well known, the Spaniards paid great attention to mining, and they appear to have explored the country very completely and to have possessed a practical knowledge of the subject, which enabled them to judge with considerable accuracy as to the conditions and prospects of the innumerable lodes they met with. Mines abandoned by them at an early stage have rarely given satisfactory results afterwards, and the principal enterprises at the present day are merely continuations of the ancient workings.

The Spanish miner enjoyed the protection of the Government, and the facility of obtaining Indian labor at an almost nominal cost. A large proportion of his production went. however, to the State and when we consider the otherwise scanty resources at his command, it must be admitted that much was effected, and that the country possessed at that time men of great energy and enterprise and of no mean capacity.

Metallic veins are profusely scattered over the Bolivian tableland, and on this only, the order in the following list of the principal metals probably indicates their relative importance, silver, tin, copper, gold, bismuth, antimony, lead and cobalt.

The richest deposits of gold however do not occur on the tableland itself, but are met with in the great ravines, "quebradas," on the eastern slope of the Cordillera; owing to the inaccessible nature of the country for machinery they are at present but little worked.

The Bolivian silver mines, by far the most considerable, occupy the southern half of the tableland, no important workings being met with north of the 17th parallel. The composition of the ores is varied; in addition to native, ruby silver, and chlorides, the metal is associated with sulphides of copper, iron, lead, zinc, and antimony, and with tin oxide; in many cases the upper part of the lodes was largely composed of chlorides extending to a depth of from 100 feet, to 200 feet. These chlorides were nearly all worked out by the Spanish discoverers, being treated by the "patio" or Mexican amalgamation process. It appears that the early Spaniards were ignorant of the mode of treating sulphides, and many mines were abandoned when the workings reached these.

As regards changes in the value of the ores with increasing depth, a steady improvement has taken place in some cases, as in Huanchaca, down to a certain point, while in "Cerro" of Potosi the upper regions seem to have been the richer. Other mines show considerable uniformity in the silver contents of the ore at different levels. All the mines worked by the Spaniards have proved rich in the bottom. Some were evidently stopped owing to the want of adequate means for taking out the water, while the remainder were abandoned on the breaking out of the War of Independence, and it was only after the lapse of nearly half a century that this industry began to revive.

Bolivian silver mining enterprises of the present day are, perhaps, on the whole, rather charcterized by the high quality than by the quantity of ore; it is true large masses of poorer ores exist at many points, but the expense hitherto attending their treatment in that country has prevented their being worked to advantage.

The mines at Oruro, which town is illustrated in Fig 1, are among the more important in the country, and are situated in an isolated group of hills rising some 800 feet above the plains on the eastern border of the tableland, and are some 300 miles from the nearest seaport, Arica. Extensively worked by the Spaniards, they were abandoned since the begging of this century till about 25 years ago, when mining operations on a small scale were recommenced. A system of more or less parallel lodes cross the hills in a direction from E. S. E. to W. N. W., and on these are situated four important mines, viz., Atocha, San José, the Socavon de la Virgen and Itos. These lodes, usually from two feet to five feet wide, are composed of iron pyrites, occasionally barren, but generally more or less interspersed with sulphides of silver, copper, antimony and tin oxide, while in some rich but narrow veins the iron pyrites are absent; in the upper part of the lodes, and to a depth of some 150 feet, the silver occurred chiefly in the form of chloride. The fissures occupied by these metallic deposits have evidently been formed by an irruption of porphyritic rock.

The old Spanish workings often extended to a depth of from 300 feet to 400 feet, and to clean out and dry these was not easy task with the limited resources at hand. The discovery, however, about fifteen years ago, of a rich pocket of ore in the Atocha mine, gave a considerable

*From *Engineering*, to which we are also indebted for the illustrations.

impetus to the industry, horse whims were erected, vertical shafts sunk, and mills built for grinding and treating ores on a somewhat larger scale.

Many of the workings having now attained a depth of from 600 feet to 800 feet, and as in addition to rock and ore it is necessary to extract from 15 to 60 tons of water daily, animal power is found unequal to the requirements, and steam-winding machinery is being substituted in the San Jose Mine, a fine 40-H. P. engine by Robey, together with two 40 H. P. Knap's patent Root boilers, are at present in course of erection, and a more commodious shaft supplied with skipways is being sunk.

The inferior class of fuel available is at present a difficulty in the employment of steam power, but this will no doubt be obviated on the prolongation of the Autofagasta Railway. Three kinds of fuel exist in the neighborhood, viz.: "yareta," a resinous plant met with only at considerable elevations, a fairly good class of turf, and the dung of the llamas, and though there is no difficulty in maintaining with these the necessary steam pressure, a considerable excess of boiler capacity is indispensable. With greater facilities for extraction, large masses of ore of an inferior quality left in the upper workings may be taken out to advantage.

The ore as extracted from the mines is broken and picked by hand, the richer portions containing 400 ounces and upwards to the ton being separated for exportation, while the poorer varieties ranging down to 80 ounces are despatched in carts to the mills.

The scarcity of water and the absence of water power in the immediate vicinity of Oruro, led to the amalgamating mills being situated at distances of from 10 to 20 miles, on streams which descend from the neighboring mountain ranges; at these points iron water wheels (Fig. 2) of from 20 feet to 30 feet in diameter have been put up, running from 10 to 20 stamps each. In one of the mills the ore is pulverized dry, in all the others water is introduced to the stamps. The pulverized ore, in charges of 4 cwt., is passed to the calcining furnaces, where it is subjected to a moderate heat, which is increased later on. Towards the close of the operation, which lasts about three and a half hours, 12 per cent. of salt is introduced to effect the chlorination, when the mass is ready for amalgamation. The amalgamation was formerly carried on in copper kettles cast on the spot, and of a capacity of from 100 pounds to 150 pounds of calcined ore but of late years wooden tubs run by steam machinery have been introduced, effecting a great economy; these tubs are from 5 feet to 6 feet in diameter by 3 feet to 4 feet deep and are furnished with thick cast copper soleplates, similar segmental plates being also secured round the sides, while a vertical axle run by bevel gearing above, causes three or four copper arms to revolve on the soleplate, the axle admitting of being raised and lowered to facilitate the cleaning up of the amalgam; the tubs have a capacity of from 2,000 pounds to 4,000 pounds of ore and each operation lasts about six hours,

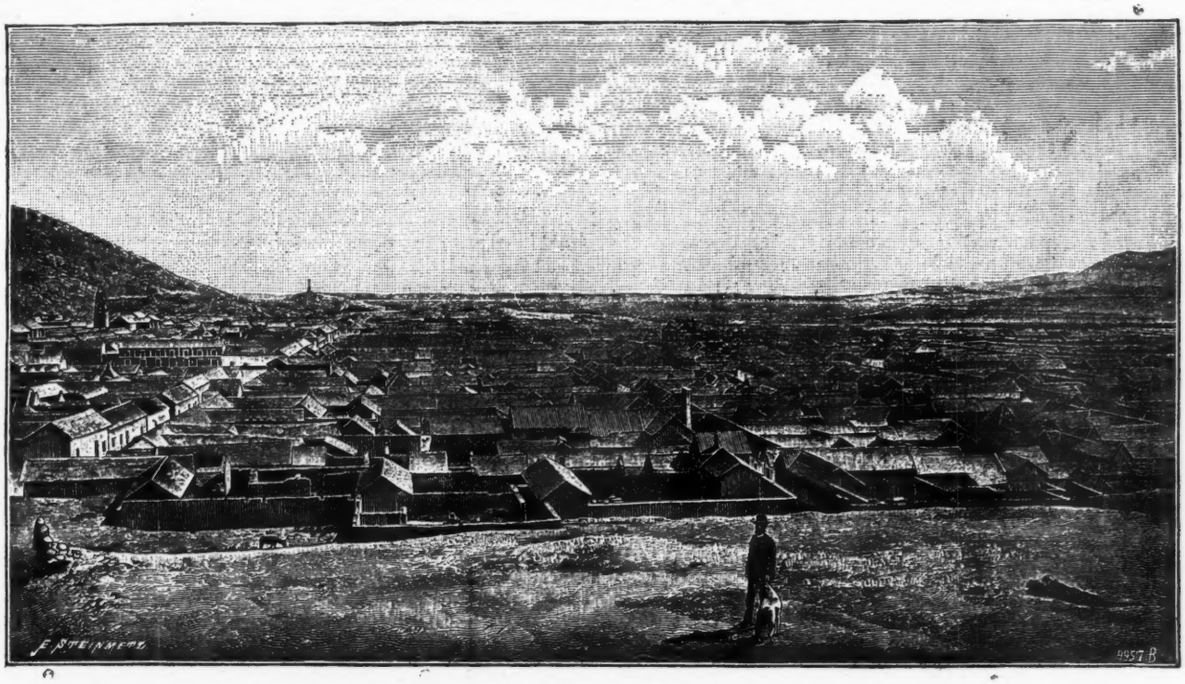


FIG. 1.—ORURO, BOLIVIA.

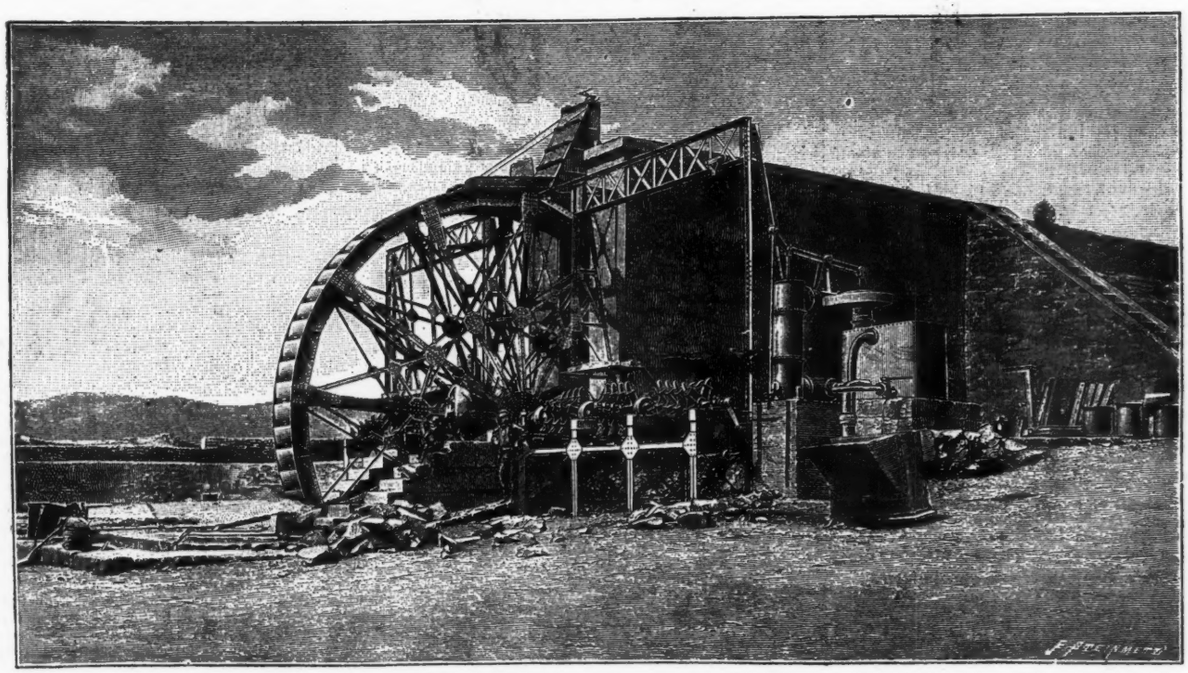


FIG. 2.—IRON WATER WHEEL IN BOLIVIA.

during which steam, under a pressure of from 40 pounds to 60 pounds, is injected to maintain as high a temperature as possible, 12 per cent. of salt being again employed in this part of the operation. The loss of silver by the old system of kettles was not less than from 25 to 30 per cent. of the assay contents of the raw ore, while by the employment of tubs it has been reduced to about 15 per cent. The amalgam collected, washed and pressed in cylindrical moulds, is strongly heated for some eight hours in vertical retorts until all the mercury distills off and is condensed in a vessel of water below, when the mass of spongy silver, or "piña," is ready for shipment The total loss of mercury is from four ounces to six ounces for every pound of silver extracted, while the wear on the copper plates is rather more than double the weight of the silver.

Most of the Oruro ores contain from 5 to 20 per cent. of tin oxide; the tailings from the amalgamation are consequently washed, either by hand or with Frue vanners to extract this, when a product containing from 64 to 68 per cent. of metallic tin is obtained.

Precise data do not generally exist for determining the average silver contents of the lodes, but in the "Socavon de la Virgen" it has been ascertained that the silver extracted during the past two years represents 100 ounces to the ton on the total mass taken out.

The Oruro mines during the past few years have afforded an average of about 28 tons of picked ore per day, which, with about one ton of rich ore exported brings up the total production to about 1,500,000 ounces yearly.

Traffic to the coast is chiefly carried on with mules and donkeys; the freight on imported goods is £17 per ton, and on exports £12 per ton, though these rates are subject to certain fluctuations.

The silver, though of greater value, represents but a small fraction of the tonnage yearly sent to the coast, the greater part of this being in the form of tin ore. The natives are excellent workmen and are easily managed; but owing to the increased number of mines opened up of late years, labor has become scarce. A miner gains 3s. 6d. a day, and is supplied with powder and fuse.

Materials in general are costly, especially machinery, owing to the heavy freight from the coast, but salt is comparatively cheap; this is brought on llamas from the deposits which exist further south on the tableland and is delivered at the mills for 2s. 6d. per cwt.; flour, grain, and other produce from the fertile valleys to the east are also supplied at very reasonable prices. In the San José mine the total expenses range between 60 and 70 per cent. of the gross production.

STEEL VERSUS WOODEN RAILROAD TIES.

The Standard Metal Tie and Construction Company, this city, furnishes the following comparative estimate of the cost of standard railroad track laid with wood and with steel ties:

ESTIMATE OF COST OF ONE MILE OF STANDARD TRACK WITH WOODEN TIES AND STONE BALLAST.

119 3-7 tons of 76-lb. rails, at $32 per ton	$3,821.71
2,816 cross ties, at 80 cents (first class)	2,252.80
352 joints, at $1 each	352.00
6,034 pounds spikes, at 3 cents per pound	181.02
3,400 cubic yards stone, at $1.05 per yard	3,570.00
Labor	1,800.00
Total	$11,977.53

ESTIMATE OF COST OF ONE MILE OF TRACK WITH STANDARD STEEL TIES AND GRAVEL BALLAST.

Rails as above	$3,821.71
2,112 standard steel ties, at $2.50 each	5,280.00
352 standard steel tie joints, at $2 each	704.00
3,000 cubic yards gravel, at 25 cents per yard	750.00
Labor	500.00
Total	$11,055.71

THE MINERAL WEALTH OF KULU.

The following notes, drawn from John Calvert's "Kulu & Vazeeri-Rupi, the Silver Country of the Vazeers," of the mines of the Vazeeri-Rupi, India, point to apparently inexhaustible treasures of silver, copper, lead, antimony, bismuth, iron, etc., hidden away in an almost inaccessible recess of the upper Himalayan range, covering an area of 677 square miles, surrounded by mountains, two or three of which are over 20,000 feet above the level of the sea, and always capped with snow; only few entrance passes give access to the wealth concealed within those mountains, which wealth, according to tradition, is jealously guarded by the devil-god Davi, who exercises through that potent element, fear, an illimitable power over the minds of an ignorant, superstitious and priest-ridden people. The Vazeeri-Rupi, or silver country of the Vazeers, was surveyed some years ago, and all the known mines were carefully plotted.

The Tehseel of Kulu, comprising Kulu proper and Vazeeri-Rupi, contains about 40,000 inhabitants, 3,000 of whom dwell in Vazeeri-Rupi territory, 1,200 in the town of Sultanpur, and the remainder in villages scattered throughout Kulu proper. The climate of Kulu is represented to be as pleasant as in the south of England; the inhabitants are quiet and inoffensive; their religion is devil-worship, and both polygamy and polyandry are time-honored customs of the country.

Sultanpur, the capital of Kulu territory, and the seat of its Rajah, who is the lord of the gold, silver, copper, iron, salt, sapphire, ruby and other mines, is in latitude 31·58 north, or nearly so, and in the same longitude as Simla, 77·22 east, and is situated in a valley only 4,092 feet above the sea-level; the high peak across the Beas river, Kinchall, is 11,440 feet, Rumetu 12,084 feet and Bigli 8,070 feet above the level of the sea. This valley is noted for its beautiful scenery. There are but few approaches or entrances to this valley, that by way of Kangra and the Baba pass is represented to be the best, the road being wide and easy of ascent. This pass is 10,000 feet high, and during four months every winter blocked with snow and ice, during which season visitors must enter by the Bagora pass, 7,000 feet high and in the direct road from Simla.

Gold exists in considerable quantity in the beds of both the Beas and Parbutti rivers, the former flowing through Kulu proper, and the latter watering the silver country of the Vazeers, forming a junction with the Beas at a place called Buin, where there is a ferry; gold thus found in the detritus borne along by rivers, fed by numerous mountain streams, is a sure indication that gold in situ exists somewhere in the vicinity and only requires intelligent search to be found. Silver, copper, lead, and iron ores are unquestionably abundant, also rock crystal, tourmaline, kyanite, hornblende, green oxide of chrome, micaceous iron, spathic iron, carbonate of iron, mispikel or arsenical pyrites, pyrolusite, galena, stibnite, kermesite or red antimony, cervantite, carbonate of lime, zinc blende, copper pyrites, sulphate of copper or blue stone, carbonate of baryta, feldspar, mica, serpentine asbestos, salt, limestone, garnets, sapphires, rubies, sulphur gypsum, borax and epidote.

The rocks examined comprise a coarse feldspathic gneiss, metamorphic sandstones, clayslate, sandstone shales, limestone, conglomerates, micaceous sandstones, shales, schists and slates—also good building sandstone.

It is on record that, in the upper Ramur valley, sapphires worth Rs. 2,500 each were found, besides other gems; and at Shigri, which is situated in Lahoul, an antimony lode was discovered 40 feet in width, also another ponderous lode of black antimony a little higher up the same hillside. It is further stated that the government granted a lease of these antimony mines for a period of 20 years on easy terms, and that a lease of the entire mining rights of the Vazeeri-Rupi country was also acquired, but with much difficulty, from the Rajah residing at Sultanpur, with the knowledge and sanction of the British Government.

GEMS AND PRECIOUS STONES.

The *American Geologist*, in its issue of August, says:

"'Gems and Precious Stones.' By George Frederick Kunz. Pp. 336. Scientific Publishing Company, New York, 1890. Undoubtedly the most artistic book of the year and of a nature both popular and scientific is Mr. Kunz's present work. No one is better fitted to write upon this important subject than Mr. Kunz. His great experience with gems and precious stones in all conditions makes this present volume of inestimable value. The subject is treated in a manner which appeals both to the scientific and general reader, and in every line he finds himself delighted. Naturally enough the diamond is first treated, and then all the other minerals which have been or could be used for gems are successively described. The author deserves great credit for the manner in which the book appears and the beautifully executed plates by Messrs. Prang & Co. add much to the value of this sumptuous volume."

The *American Journal of Science*, in its issue of June, says: "Gems and Precious Stones of North America."—A popular description of their occurrence, value, history, archæology, and of the collections in which they exist; also a chapter on pearls and on remarkable foreign gems in the United States. 336 pp., large 8vo, with 8 colored plates; by George Frederick Kunz. New York, 1890. The Scientific Publishing Company. —The American reader, who is attracted to the subject of gems, will find much to interest and instruct him in the handsome volume by Mr. Kunz. Starting off in each chapter with a brief mineralogical description of the species under discussion, the author goes on to give a detailed account of its occurrence in this country, the value of the stones found, the present owners of the finest ones and other allied points, embracing much information which has not been brought together before, and which the author's position has given him peculiar facilities for collecting. The fact that the book has been written in popular form for the general public should give it a wide range of readers. At the same time this removes it from the kind of criticism to which a work striving for minute scientific accuracy would be liable. The publishers have shown much enterprise in the handsome form in which the book has been put as regards paper and presswork, and the numerous colored plates which ornament it are of very unusual excellence; it is rare indeed that the delicate coloring of the various gem stones, and of the natural mineral specimens, has been reproduced so faithfully.

Observer, Colombo, Ceylon, of the 8th ult., says:

"We have received, from the Scientific Publishing Company, of New York, a copy of a truly magnificent work, the scope and value of which are truly described in the accompanying letter, thus:

'We take especial pleasure in announcing the publication of 'Gems and Precious Stones of North America,' by George F. Kunz. This book is pre-eminently the standard work of its kind and is indeed the only one which treats of the subject in a detailed and thorough manner. It is a systematic and at the same time a popular description of the several species and varieties of precious stones and pearls, their occurrence, value, history and archæology. For the collector of precious stones and minerals it is especially valuable, the illustrations being all drawn from the finest known examples, and reference being made to the collections in which they may be seen. No work has ever appeared which furnishes to the archæologist and antiquarian so many references to the precious stones and pearls which have played an important part in early history.

'This magnificent work is profusely illustrated with the finest colored plates ever prepared for a book of this kind. The publishers have spared no expense to make this in every respect the finest example of American art.'

"Neither the value of the letter-press nor the exquisite beauty of the colored illustrations is in the slightest degree exaggerated by the publishers, who have, with the author, reason to be proud of the addition they have made to the literature of America in general, and of the science of mineralogy in particular. We hope, ere long, to have the pleasure of giving a more extended notice of this unique work."

Engineering, in its issue of 25th ult., says:

"The general public, apart from geologists and mineralogists, will welcome the magnificent work on 'Gems and Precious Stones of North America,' just issued by the Scientific Publishing Company of New York. In this country [England] there is almost as great a regard for and interest in diamonds as in America, so that here also the work, for its extensive general information, will be appreciated. The work is valuable for many reasons. It is the production of a man who has spent a lifetime in research, and may be regarded as one of the best authorities on the subject. He is associated, as gem expert, with Messrs Tiffany & Co., who have a world-wide reputation, and whose stand at the Paris Exhibition excited so much admiration. The author also holds the office of special agent of the United States Geological Survey, as well as honorary positions in the leading mineralogical societies in America and Europe, and in

these capacities obtained great assistance in his work of research. The subject is treated most comprehensively, and precious stones are examined from every standpoint, the great skill of the writer being reflected in the popular manner adopted in the descriptions. Not only are the geological and archæological characteristics of the gems dealt with, but their incidence, value and history are examined, while the parts of the work dealing with famous collections of stones are specially interesting. The instructions regarding the testing of the genuineness of stones and the removing of stains are invaluable."

After an abstract of the work covering four whole columns, *Engineering* concludes its review as follows:

"The letter-press and binding of the book is an evidence of the high reputation for superior workmanship of the Scientific Publishing Company."

EXPLOSIVE GAS DETECTOR.

Accidents caused by explosive gases in mines, factories and in vessels, specially those with coal cargoes, are so frequent and disastrous that any rational scheme or design, even if yet untried, aiming at the suppression of the danger, deserves careful study. Mr. Eduard Stern, 48 Aachenerstr., Cologne, Germany, the patentee of an invention for the detection of the presence of explosive gases, writes us in substance as follows:

—The apparatus consists mainly of a porous clay cylinder with thin metallic membranes suspended in it. Accumulated gases, particularly hydrated carbonic gases, penetrate the porous material, which is impermeable to coal dust, and causes the membranes to expand upward until they reach a contact screw, whereby the electric current is closed and an alarm work brought into action. The contact screw can be adjusted to indicate one per cent., two per cent., 20 per cent. or any greater quantities of gas.

The apparatus is equally practical in application to mines, gas factories, hulls of vessels and private dwellings to give proper warning of approaching danger of explosion or asphyxiation.

Its sensibility to heat is so great that a burning match held at a distance of 10 to 12 centimeters from the apparatus is sufficient to make the heated air close the circuit within four seconds—an apparent proof of its efficiency as a fire-alarm also.

The greatest utility of this invention may be derived from its application to vessels carrying coal on long voyages. The peril to which they are exposed, of spontaneous ignition of fire damp, generated by the presence in the coal of pyrites, by moisture, heat, etc., is so great that insurance companies often refuse to take the risk of such vessels and only accept it on payment of a very high premium. In fact, the mysterious disappearance of a great number of coal vessels is generally ascribed to the generation and firing of combustible gases. About 12 apparatus of this new design should be placed in such ships near the deck and protected against pressure by a wire net. They will, before the danger is imminent, raise an alarm at a central station, with which they are connected by wire, in such a way that it must be heard by the crew. An annunciator, similar to that used in hotels, enables one to locate that part of the hull where the danger is lurking, and the accumulated gases are then removed by means of pumps inserted in the vessel for that purpose.

The apparatus can be put up in any room, is very simple of construction and not expensive. Patents have been secured in all civilized countries.

The fundamental idea of this design appears to be based on the fact that different gases penetrate porous matter at rates that differ according to the gases used. But how far Mr. Stern has succeeded in making this fact serve the purpose in view in a practical, reliable manner is a question which extensive trials, and those alone, can answer, and we shall be interested in learning the results of such trials.

SOCIETIES.

AMERICAN SOCIETY OF CIVIL ENGINEERS.

The following papers and discussions are announced for the meeting of September 3d, 1890: Notes on a Mountain Slide, by William G. Curtis, M. Am. Soc. C. E.; for the meeting of September 17th, 1890: Discussion on Paper by W. Barclay Parsons, M. Am. Soc. C. E., on Railways in Mexico, by Max E. Schmidt, M. Am. Soc. C. E., and discussion on paper by F. W. Watkins, M. Am. Soc. C. E., on Tunnel Surveying on Division No. 6, New Croton Aqueduct, by O. F. Nichols, M. Am. Soc. C. E.

The Ericsson Submarine Gun is offered to the United States Government by Geo. H. Robinson, formerly of the Delamater Iron Works, who contends that its adoption will enable the government to convert its obsolete heavy smooth bore guns into submarine torpedo guns at a very small cost.

Frost Proof Cement.—A cement which is said to withstand frost consists of (*a*) 1 litre of Portland cement, 3 litres of river sand, and (*b*) 1 litre of lime cement and 3 litres of river sand, mixed with a solution of 1 kilogram of crystallized soda in 2 litres of water—a mixture whose ingredients when exposed to a temperature of —12.5 degrees are not in the least altered in their adhesive properties.

A New French Canal.—The French Minister of Public Works has inaugurated a canal from the Aisne to the Oise. The length of the canal is 1¾ miles. It has been constructed in order to facilitate traffic by water between the north and the east of France, reducing a voyage between these parts by no less than 36¼ miles. The works upon the new canal comprise two canal bridges, 13 sluices, and a tunnel 2,628 yards in length.

Manganese Plating of Iron as a Protection from Rust.—According to our Italian contemporary, *Progresso*, articles of iron can be protected against rust by sinking them near the negative pole of an electric bath composed of 10 litres of water, 50 grammes of chloride of manganese, and 200 grammes of nitrate of ammoniac. Under the influence of the current the bath deposits on the articles a film of metallic manganese which prevents them from rusting.

Prevention of Breaking of Mine Timbers.—To prevent the premature breaking of the wall props, the Consolidated Mining Company in the district of Aachen has, after experimenting for some time, found that when three or four notches, 30 centimeters deep, have been sawed in the top part of the wood, this yields to the pressure by being compressed, but does not break. The economy in the item of timber has not yet found an expression in figures.—*Ztsch. f. d. Berg-, Hutten- u. Salinenwesen.*

Durability of Pump Valves.—The effectiveness of hard india-rubber in tightening valves of high-pressure pumps has been found to be very great. The subterranean draining works at the Maybach mine at Saarbrücken have run five years, averaging daily 10 hours, with 60 to 72 double strokes per minute, and under a pressure close to 50 atmospheres, without requiring a renewal of any part of the valves—a result which comparisons show to be due to the use of the india-rubber. This must, however, be neither too soft nor too hard or brittle, and particularly not unevenly hard.—*Ztsch. f. d. Berg-Hutten-u. Salinenwesen.*

New Non-Conducting Material.—According to the *Practical Mechanical Electrician*, mineral india-rubber asphalt, produced during the process of refining tar by sulphuric acid, forms a black material very much like ordinary asphalt and elastic as india-rubber. When heated so that the slimy matter is reduced to about 60 per cent. of its former size, a hard substance is produced resembling ebony. It can be dissolved in naphtha, and is an excellent non-conductor of electricity, and therefore valuable where a non-conducting substance is needed, as for covering telegraph wires. Dissolved, the mineral india-rubber produces a good waterproof varnish.

The Use of Eucalyptus Fluid in Boilers.—A writer in *Indian Engineering* of June 7 states that the use of eucalyptus fluid in boilers is likely to become general on the railways in India. Trials have already been made on the Bengal & Northwestern Railway with good results. This patent fluid is now sold in the Bombay market at ⅝ rupees per gallon. The species of the plant which seems to be the most preferred is the *Eucalyptus globulus*. On the Bombay & Northwestern Railway they put into a dirty boiler 12 gallons of the fluid, and repeat the operation after each trip of from 300 to 450 miles. The action begins after the first trip, and takes the scale clean off the copper box in a month, but during this time the fluid acts more slowly in softening and loosening scale from the iron shell, and still more slowly from the brass tubes.

Corrosion of Zinc when in Contact with Brick.—A German paper mentions the fact that, under some conditions, sheet zinc, when in direct contact with brickwork, suffers to an appreciable extent from rapid corrosion. In building the Berlin city market halls, a portion of the zincwork which rested upon brick walls was found to be deeply pitted at a number of places, particularly where the metal was close to the bricks. Chemical examination of these resulted in showing that they contained as high as 1·14 per cent. of soluble salts, of which the destructive effect increases by moisture. The proportion of such salts varies with different kinds of brick, while in some there may be nothing to induce any such corrosion. As a preventive, roofing felt or similar material may be placed between the zinc and brick work.

Production of Coal.—*Revue Universelle des Mines* gives the followin table of the production of coal in millions of metric tons:

	1870.	1873.	1879.	1883.	1886.	1887.	1888.	1889.
Great Britain	112·2	129	135·8	166·4	160·0	164·7	172·6	179·7
United States	30·7	51·3	63·8	104·5	102·3	117·9	134·8	134·4
Germany	34	46·1	53·5	70·4	73·7	76·2	81·9	84·9
France	13·1	17·5	17·1	21·3	19·9	21·3	22·6	24·6
Belgium	13·7	15·8	15·4	18·2	17·3	18·4	19·2	19·8
Austria-Hungary	8·3	11·9	14·9	19·4	20·8	21·9	23·8	25 ?
	212·0	271·6	300·5	400·2	394·0	420·4	454·9	468·4

Protection of Mine Timbers from Decay.—The German government mine Altenwald, near Saarbrücken, has, since 1888, conducted a series of experiments to ascertain the most effective means to prevent from decaying the pine timbering which is subject to great pressure in the airways. Lime, coal tar, tar and carbolineum were tried in such a manner as to enable to compare their relative protective value. The results as published in *Ztsch. f. d. Berg-, Hutten- u. Salinenwesen* show lime to be the weakest. Coal tar preserved the outside of the timber, while the core was found completely decayed. Carbolineum proved by far the best and is now being used on all the timbering of the upcast in that mine. The mine timbers, made of wood peeled and dried, are twice painted over with the carbolineum above ground and require each, when 2·5 meters long and 0·25 meters in diameter, in the first application ½ kilogram and in the second ⅛ kilogram, so that, at a price of 34.5 pf. per 1 kilogram, the total cost was: For material 48·3 pf. and for labor 14 pf., or altogether about $0.15.

Haase's System of Shaft-Sinking.—At the Guerrini coal mine, where, as mentioned in our issue of June 21st, the Haase system was used to sink through the quicksands, a mishap took place when a depth of 23 meters was reached; the pressure necessary to drive the tube through a mass of firm coal caused it to bend and to spring aleak. In order to stop this a set of tubes was driven down in the lower end of the shaft inside the original cribbing, and the space between the two cribbings was filled with gravel. The flow of water has already diminished considerably, amounting, in the depth of 23 meters, to only 600 litres per minute, while formerly it had reached 1,500 litres in the pump shaft.

The management of the Neu-Gröben at Gröben, Germany, has also successfully made use of the Haase system in order to sink through seven meters of quicksand. As the tubes on their downward course met no

obstacles, the work was accomplished within two and a half months.—*Ztsch. f. d. Berg- Hutten- u. Salinenwesen.*

The World's Mineral Wealth.—Professor J. von Ehrenwerth gives the following statistics are representing the average yearly production of the more important metals and minerals during the last ten years throughout the world:

	Quantity.	Value in £1,000,000.
Coal	405·5 million tons	163·7
Iron	19·6 "	58·8
Gold	137,945 kilog.	22
Silver	2,860,487 "	25·7
Lead	485,925 tons	5·8
Copper	222,360 "	10
Zinc	309,541 "	4·6
Tin	28,997 "	2·9
Salt	7,576,267 "	11·3

From the above figures it will be seen that the value of the annual production of coal and iron is nearly five times that of the gold and silver obtained in the same time.

A Luminous Buoy.—Experiments with a luminous buoy invented by M. Dibos have been made at Havre. By improvements, effected since a previous experiment, in the arrangement of the phosphuret of calcium in the apparatus, the inventor has obtained fewer intermissions in the production of the light and a prolongation of the duration. A first buoy, thrown into the channel opposite the semaphore, emitted a powerful light upon coming in contact with the water. During this time a boat left the harbor, and when about a mile and a half out another of the buoys was thrown into the water, which lit up the sea within a very large radius. The power of the light was such that the men at the lighthouse, two miles and a half distant, saw it clearly with the naked eye. It has, besides, been proved in former trials that the light can be seen at a distance of five and a half miles. The French authorities intend making trials of lighting the channel on the Seine, from the Amfard Bank to where the dykes commence, by means of decked boats with masts about two meters high, on the top of which will be placed a light of this kind.

Hard Steel Tinning.—The tinning of hard steel is advocated by a writer in one of the English mechanical papers, on the ground that a bath of melted tin will not injure the temper or materially soften hardened steel surfaces, the fact being that tin melts at 442 degrees and polished steel acquires straw color at 460 degrees F. In carrying out this process the iron or steel article is first freed from scale by means of a pickle of dilute sulphuric acid and the scratch brush or sand; or, if the articles are of steel and have been quenched or hardened in oil, every trace of this is first removed by immersion in a boiling soda lye and the surface made chemically clean; even the film of oxide due to a pale straw color will prevent the perfect adherence of the tin to the steel. The bath consists of one part hydrochloric acid to about twenty parts of water; in this the article is held for a few seconds by means of a pair of brazing tongs, then withdrawn, and, while still wet, immersed instantly in a ladleful of melted tin, the surface of this being kept from oxidizing by a flush of good, clean tallow. Care is necessary not to overheat the tin beyond the proper melting temperature, and in less than half a minute the article, when withdrawn, is found completely tinned.

The Sault Ste. Marie Canal.—The annual report of General Poe, the United States Engineer in charge of the government works at Sault Ste Marie, for the year 1889, shows that the average cost of transportation on the vast quantity of freight—7,516,022 tons—which passed through the St. Mary's River Canal was 1⅛ mills for carrying one ton one mile. The total freight charges were $8,634,246. On similar freight, for a like haul, the average charge on first-class railroads is about three times 1⅛ mills per ton per mile. In extreme cases it may be as low as three mills per ton per mile, or twice the average vessel rate. It is fair to presume, moreover, that but for the competition of lake carriers, the average rates on the trunk lines would be much higher than is actually the case.

Taking the ratio of railroad charges to vessel rates at only three to one, however, the freight bill on the products which passed through the St. Mary's River Canal last year was about $17,000,000 less than it would have cost to ship the same merchandise by rail. The difference is twice as great as the gross receipts of the vessel owners. It is clear, therefore, that the classes most vitally interested in the improvement of lake channels are not the ship owners and sailors, but the farmers of the Northwest, the flour consumers of the East, coal buyers in Minnesota, and iron mill workers and manufacturers of iron in Ohio and Pennsylvania. Vast industries now flourishing would be virtually destroyed for the time being by any accident which closed the ship canal at the "Soo." They could not exist if left dependent on railroads alone.

Electricity in Mines.—The following are some particulars relating to an electric haulage plant installed at the Erie Colliery of the Hillside Coal Company, at Scranton. The power plant consists of a 60 horse power Armington and Sims engine, and a 50 horse power Thomson-Houston dynamo, wound for a current of 220 volts potential. The engine and dynamo room are at the top of the shaft. From the dynamo to the foot of the shaft the current is conducted by wires, inclosed in gas pipes to protect them from damage. From the bottom of the shaft the wires are carried overhead about 12 inches outside of the low rail of each track.

Connections from the mains to the overhead conductor are made at suitable intervals, and a portion of the current is utilized for lighting purposes, two 110-volt lamps being placed in series. The rails are used as conductors for the return current. The length of the locomotive over all is 9 feet 7 inches; width, 5 feet 3 inches, and height, 5 feet 6 inches. This last dimension can be considerably reduced by placing the rheostat at one end instead of on the top, as has been done in the present instance. The weight of the locomotive is 10,500 pounds, to which 1,800 pounds have been added to increase traction. The motor employed is of 40 horse power. During a period of 11½ days the average number of cars delivered at the shaft bottom by the locomotive was 559·5, against 526·95 per day delivered by mule haulage. To deliver 700 cars per day of 10 hours the time of running the locomotive would be 5 hours and 30 minutes, leaving 4 hours and 30 minutes for contingencies. The total distance run would be 21·28 miles, and the locomotive would be reversed 232 times.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent Office:

PATENTS GRANTED TUESDAY, JULY 15TH, 1890.

432,020. Brake for Motor-Cars. Harry A. Crossley, Cleveland, O.
432,022. Means for Generation and Conversion of Electric Energy. Angel De Castro, New York, N. Y.; assignor to the De Castro Electric Generator Company, same place.
432,026. Feed Water Purifier. Benjamin F. Field, Chicago, Ill.
432,039. Car-Coupling. William J. Harkness, Yankestown, Ill.
432,049. Electric Railway. Rudolph M. Hunter, Philadelphia, Pa., assignor to the Thomson-Houston Electric Company, of Connecticut.
432,055. Feed-water Heating and Purifying Apparatus. Robert Learmonth, Buffalo, N. Y.
432,059. Metal Tubing. Charles Maschmeyer, Meriden, Conn., assignor to the Edward Miller Company, same place.
432,069. Clutch Operating Mechanism. Wolcott J. Parmelee, Wilkesbarre, Pa.
432,080. Hydrocarbon Burner. Sumner C. Reilly, Terre Haute, Ind.
432,083. Metallic Car. Charles T. Schorn, Philadelphia, Pa.
432,101. Rail Joint. Richard N. Wald, Earlville, Ill.
432,102. Pulley Clutch. Edward Waldron, Philadelphia, Pa.
432,105. Water Wheel Governor. Amos W. Woodward and Elmer E. Woodward, Rockford, Ill.
432,114. Gas and Air Engine. George B. Brayton, Exeter, N. H.
432,116. Excavating Apparatus. Henry Casebolt, San Francisco, Cal.
432,142. Electric Locomotive. Walter H. Knight, New York, N. Y.
432,156. Journal Book. Andrew D. Cox, West Winchester, Ontario, Canada.
432,157. Shaft hanger. Andrew D. Cox, West Winchester, O ada.
432,161. Channeling Machine. Michael Griffin, Weymouth, Mass., assignor of one-half to John W. Hart, same place.
432,162. Covering for Pipes. Hiram M. Hanmore, Santa Cruz, Cal.
432,179. Friction Clutch. Ebenezer S. Capen, Worcester, Mass., assignor, by direct and mesne assignments, to the P. Blaisdell & Company, same place.
432,183. Stone Sawing Machine. John H. Frenier, Rutland, Vt.
432,209. Electric Clutch. James F. McLaughlin, Philadelphia, Pa.
432,260. Hydrocarbon Engine. George B. Brayton, Boston, Mass.
432,289. Metallurgical Furnace. Robert F. Nenninger, Newark, N. J.; assignor to the New Jersey Furnace and Smelting Company, of New Jersey.
432,281. Apparatus for producing highly heated gas. Robert F. Nenninger, Newark, N J., assignor to the New Jersey Furnace and Smelting Company, of New Jersey.
432,336. Explosive compound. Sergey D. Smolianinoff, San Francisco, Cal., assignor, by mesne assignments, to the Americanite Manufacturing Company, of Virginia.
432,361. Coal Mining Machine. Joseph L. Beary, Echo, W. Va.
432,373. Double Acting Pump. Joseph M. Clark, Colfax, Wash.
432,377. Metallic Railway Tie. Elijah Dainty, Coal Bluff, Pa.
432,383. Process of reducing iron ore. Charles J. Eames, New York, N. Y.
432,399. Regenerative Gas Burner. Thomas Gordon, Philadelphia, Pa., assignor, by direct and mesne assignments, to the Siemens Lungren Company, of Pennsylvania.
432,446. Coal Breaking Machine. Alexander Simpson and James B. Alvord, Scranton, Pa.
432,463. Machine for Forming Seamless Tubes. Lyman White, Waterbury, Conn., assignor to Randolph & Clowes, same place.
432,464. Machine for Rolling Seamless Tubes. Lyman White, Waterbury, Conn., assignor to Randolph & Clowes, same place.
432,473. Friction Clutch. John W. Blodgett, Chicago, Ill.
432,497. Welding Compound. Hooper & Straut and Chancy B. Shute, Culbetson, Neb., assignors of one-third to H. D. McKelvey, same place.

TUESDAY, JULY 22, 1890.

432,510, 432,511. Triple Thermic Motor. William S. Colwell, Pittsburg, Pa.
432,515. Car Brake. Ezra Frederick, Milwaukee, Wis.
432,520. Apparatus for Coating Plates with Tin. Daniel Edwards, Richard Lewis and Philip Jones, Morriston, Swansea, England.
432,542. Furnace. Charles F. Miller, Lancaster, Pa., assignor of five-eighths to Bernard J. McGraun, same place, and A. J. Dull, Harrisburg, Pa.
432,551, 432,552. Raid Joint. Milton C. Niles, Oik Park, Ill.
432,559. Car Coupling. Narciso T. Quevedo, Worcester, Pa.
432,568. Automatic Dumping Cage. Burt Russell and Harry T. Parsons, Briadwood, Ill.
432,718. Apparatus for Producing Gaseous Fuel. John M. Ayer, Chicago, Ill.
432,720. Gas Engine. John C. Beckfeld, Allegheny, Pa.
432,727. Method of Electric Riveting. Mark W. Dewey, Syracuse, N. Y., assignor to the Dewey Corporation, same place.
432,754. Mining Machine. Francis M. Lechner, Columbus, O., assignor to the Lechner Electric Mining Machine Company, same place.
432,779. Protractor. John P. B. Wells, Athol, Mass.
432,781. Governor for Steam Engines. Samuel T. Williams, Baltimore, Md.
432,784. Manufacture of White Lead. Julius A. Boand, Omaha, Neb.
432,788. Blast Furnace Filling Contrivance. Alexander E. Brown, Cleveland, O.
432,794. Rock Drill. Uriah Cummings, New Haven, Conn.
432,812. Rail Joint. William L. Aurand and George F. Trackler, Forest, O.
432,593. Apparatus for Charging Furnaces. Per T. Berg, Braddock, Pa.
432,600. Friction Clutch. James Clark, Medina, N. Y.
432,629. Electric Metal Working Apparatus. Hermann Lemp and John Tregoning, Lynn, Mass., assignors to the Thomson Electric Welding Company, of Maine.
432,630. Forming or Shaping Metals by Electricity. Hermann Lemp, Lynn, Mass., assignor to the Thomson Electric Welding Company, of Maine.
432,637. Loading Elevator. Thomas McConnell, San Francisco, Cal.
432,638. Gas Motor Engine. George McGhee, Glasgow, Scotland, assignor of one-half to Peter Bust, same place.
432,646. Motor for Electric Railways. Michael H. Smith, Halifax, County of York, England.
432,651. Method of Working Metals by Electricity. Elihu Thomson, Lynn, Mass., assignor to the Thomson Electric Welding Company, of Maine.
432,652. Welding or other Dynamo. Elihu Thomson, Lynn, Mass.
432,653. Method of Welding Pipes by Electricity. Elihu Thomson, Lynn, Mass., assignor to the Thomson Electric Welding Company, of Maine.
432,679. Rock Drill. William S. Sharpneck, Chicago, Ill., assignor of one-half to Francis T. Wheeler, same place.
432,690, 432,691. Process of making Compound Ingots. Levi L. Burdon, Providence, R. I., assignor to the Burdon Seamless Filled Wire Company, same place.
432,698. Process of manufacturing Alloys or Metal of the Aluminum Group. Gabriel A. Faurie, St. Denis, France.
432,823. Magnetic Separator. George S. Finney, Chicago, Ill.
432,849. Apparatus for Raising Water. Daniel P. Wright, Berkeley Springs, W. Va.
432,875. Water Wheel. Charles C. Hogue, Corvallis, Ore.
432,892. Motive Power for Jigging Machines. James Nicholas, Benton, Wis.
432,916. Shaft Coupling. Joseph J. Valentine, Philadelphia, Pa
432,923. Device for Utilizing Waste Water Power from Natural Falls. Christian J. Zeittinger, Chicago, Ill.
432,939. Apparatus for Manufacturing Wood Gas. John Hanlon, New York, N. Y.
432,947. Roller way or Track for Dredging and other Machinery. Daniel C. Kingman, New Orleans, assignor of one-half to William G. Price, Plaquemine, La.

PERSONAL.

Mr. Theo. Sutro, president of the Comstock Tunnel Company, has just returned from San Francisco.

The North Belle Isle Mining Company has appointed Mr. E. R. Grant, No. 57 Broadway, Eastern Transfer agent.

Hon. Abram S. Hewitt, president of the American Institute of Mining Engineers, arrived in this city from Europe on the 10th inst.

E. E. Seaton, of the Low Moor Iron Company, of Virginia, has been elected secretary of the Norton Iron Works, at Ashland, Ky., vice J. K. Pollock resigned.

OBITUARY.

Nicholas Luning, a well-known capitalist at San Francisco, died on the 11th inst. of heart disease.

Prof. Alphonso Favre, an eminent Swiss geologist, died at recently Ottawa, Ont. He was in direct communication with many American geologists.

Mr. Charles Louis Fleishman, who was well known to scientific and public men of an earlier generation, died at Washington, D. C., on the 10th inst., aged 84 years.

Col. S. N. Yeomans, president of the Island City Coal Company, Indiana, died from the results of an exhaustive attack of "la grippe" at Tate's Springs, in Tennessee. He was 62 years of age, and was colonel of the Nineteenth Ohio Regiment during the civil war.

The Hon. James W. Ormsby died on the 11th inst. at Hickory township, near Sharpsville, Pa., in the 83d year of his age. Mr. Ormsby began life on nothing, and in 1873 had amassed a large fortune which was invested in the iron business. When the panic came he was an old man and was reduced to poverty. Nothing daunted, he engaged in the coal business and amassed another competency.

Joab O. Bosworth died on the 4th inst., the only victim of an explosion in the building occupied by the Denver Fire Clay Company, Denver, Colo. He was president of that concern, of the Colorado Natural Gas and Oil Company and of the Manufacturers' Exchange. He has for years been prominently identified with the material interests of Colorado, and specially of Denver, to which city he came in 1871. He was born in 1856, and leaves numerous friends.

News has been received of the death, in San Francisco, of Elijah Martin Smith, who, in 1846, sailed from New York in September of that year in the pioneer vessel for California, the *Susan Drew*. In 1848 Mr. Smith became a mine prospector, and was the first man to lead a party overland from San Francisco to the subsequently famous American River diggings. He became a comrade of Kit Carson in guiding miners and emigrants through the Rocky Mountains, and as an Indian scout and fighter. He discovered and located the first gold mines in the Pioche and Meadow Valley districts in Nevada, among them the Raymond & Ely mine, which he sold for a song. He was among the first prospectors to enter the Tombstone district in Arizona, where he located three mines, and gave up control of them for nominal sums. He was the pioneer prospector in nearly all of the silver and gold mining regions of the Northwest, but could not remain at rest long enough to reap the benefits of his many rich discoveries.

INDUSTRIAL NOTES.

The strike at the works of the New Jersey Steel and Iron Company at Trenton, N. J., is still unsettled.

The Ashland Artificial Ice Company, Ashland, Ky., has completed its works and is now making 15 tons of ice per diem.

The Ashland Fire Brick Works, Ashland, Ky., are making prepartions to increase their plant to double its present capacity. They will increase the capital stock to $50,000.

The breastwork of a blast furnace in the Illinois Steel and Iron Company's mills, at Joliet, Ill., blew out on the 13th inst. The molten metal burned two men, one of whom died soon afterward.

A riot at the Shelby Iron Company, near Columbiana, Ala., is in progress. It was brought about through ill-feeling among the negro laborers. Already several deaths are reported and serious trouble is feared.

The trouble at the Reading Rolling Mills is at an end, and operations were resumed with nearly all the old employés at work on the 12th inst. The firm did not sign the amalgamated scale, but pays the same wages.

Fifty iron molders, employed in the foundry of T. Shriver & Co., of this city, struck on the 13th inst. The cause of the strike is the refusal of the firm to sign an agreement which officially recognizes the Board of Walking Delegates.

Articles of incorporation under the laws of Kentucky have been drawn up for the Ashland Steel Works, the stock of which company will be held equally by the Belfont Nail Company and the Kelly Nail Company, of Ironton, O., and the Norton Iron Works, of Ashland, Ky.

The Independent Oil Refinery at Parkerburg, W. Va., belonging to George Rice, was blown to pieces and consumed by fire on the 13th inst. The explosion was caused by the turning of hot steam into the agitators. The loss is $75,000 with but little insurance, and destroys the entire plant. It is reported that Mr. Rice will rebuild at once and continue to fight the Standard Oil Company.

Among the heavy wire cables recently placed on the street-car lines in San Francisco are one for the Castro street line 1⅛ in. diameter, 23,000 feet long, and weighing 64,600 pounds; one for the Market street line, 24,600 feet long, weighing 64,555 pounds, and one for the Piedmont line 20,800 feet long, weighing 52,710 pounds. These cables were made in Trenton, N. J., at the Roebling Works.

The undertaking of removing the obstructions of river navigation at the Iron Gates of the Danube—a work which has in vain been attempted since the days of the Roman Empire—is now being pushed with the systematic thoroughness peculiar to Germans, combined with more than ordinary energy. The magnitude of the enterprise, extending more than 20 miles along the Danube, and estimated to cost about $5,000,000, has prompted the management to charge an expert engineer, Mr. Bezzier, with the task of personally investigating works of a similar nature in foreign countries. On his travels for this purpose he was so much impressed with the superiority of the methods and machinery adopted here, that on his special recommendation the contractors have now placed an order for a large plant of submarine drilling apparatus with the Ingersoll-Sergeant Rock Drill Company of this city. The expectation that this plant will satisfy all demands made upon it in regard to efficiency, reliability and economy is subject to no doubt, and will, when realized go far to extend the reputation of American machinery.

(From our Southern Correspondent.)

The Richmond & Danville Railroad Company has been purchasing real estate in Charlotte, N. C., for the purpose of locating shops there; it is said upon very good authority that the consolidated shops will be put up here, as it is the terminal of the more important lines of that company.

The Southern Timber and Mineral Land Investment Company has recently been organized with offices at New Orleans, Chattanooga, Asheville, Boston and Kansas City. The company owns 40,000 acres of land in Eastern Tennessee and Western North Carolina; a large manufacturing plant is to be established at Johnson City, Tenn. The capital stock of the company is $350,000.

The Augusta-Marion Improvement Company has been incorporated with a capital stock of $60,000; land in Marion (N. C.) has been purchased for improvement. The officers are C. E. Walker, president, and J. Fleming, secretary and treasurer.

The Augusta, Ga., electric street railroad is to be bonded for $400,000, and the 6 per cent. sureties will be floated in Europe. A title of the road and real estate of the company to the Metropolitan Trust Company, of New York, which will hold the property in trust for the bonds, has been filed. The money raised is to go for the further improvement and development of local industries.

NEW ENTERPRISES IN CHICAGO.

(From our Chicago Correspondent.)

The largest mercantile building in the world is to be erected on the half block bounded by State, Adams and Dearborn streets. This magnificent structure is to be 16 stories high, with a frontage of 190 feet on State street, 350 feet on Adams, and 190 feet on Dearborn street. Its cost will not be less than $3,000,000. The construction is to be of steel; the front of stone and terra cotta. The steel alone will cost $1,500,000. The ground rental of this space is $154,000 per annum, which capitalized on the basis of the usual five per cent., makes the property represent $3,080,000, which, when the cost of building is added, makes an aggregate of $6,080,000. The first six stories will be occupied by one of Chicago's big retail drygoods houses, the remaining ten to be fitted up in offices. Forty-three elevators will be put in the building, which will be lighted by a private electric plant. Three years will be required in the construction, and the building is to be fireproof throughout.

The Chicago Cold Storage Exchange is to be built. Signatures were affixed last week to deeds conveying the property for $706,000, which was paid in cash. The building will cost $1,700,000. The ground with the old building was purchased by Messrs. Colgate, Trevor and Stewart, of New York City, and by them leased to the Exchange for ninety-nine years, at a rental of six per cent. per annum on $566,000, the present cold storage building being purchased by the new company for $140,000. In the foundation of the new structure will be 8,500 piles. 1,250,000 feet of oak timber; in the masonry will be 1,310 cords of stone and 8,000,000 bricks. Six thousand tons of iron and steel will form the framework; there will be 850,000 square feet of tile arches and 30,000 square feet of skylight; 200 miles of iron pipe will be used in the refrigerating rooms. Contracts for the construction have already been signed, and actual work begun. The building will be put up in sections, four of which at the north end will be, it is expected, ready for occupancy early next year. It will be about two years before the whole is completed.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of the subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

1,007. A good second-hand engineer's transit. North Carolina.

1,011. A 15 horse-power engine and 20 horse-power boiler. Alabama.

1,012. A 20-inch lathe, 10 feet between centers; an 18-inch lathe, seven feet between centers and a 24 × 24 × 6 planer. Alabama.

1,013. A bolt and pipe cutter, and a 24-inch drill back gear. Alabama.

1,014. All kinds of wagon and carriage material. Florida.

1,015. Correspondence with reliable parties able to furnish hand and steam fire engines. South Carolina.

1,016. Planer, lathe, and picket machines. Tennessee.

1,017. Machine lathe with 36-inch or 40-inch swing, that will take from 12 to 14 feet between centers. Ohio.

1,018. A first-class second-hand Corliss engine of about 150 horse-power. Minnesota.

1,019. Estimates for lighting a town of 1,700 inhabitants with electric lights. Georgia.

1,020. Engine and boiler. Tennessee.

1,021. A new or second-hand engine for immediate service in laying track and other construction purposes. Kentucky.

1,022. Two 75 horse-power or one 150 horse-power automatic engine, two 100 horse-power tubular boilers, and wire rope or other transmission of power; machinery for wheel mills (8 to 10-ton wheels), corning mills, making powder kegs (sheet iron), and grinding damp nitrate soda fine; boiler iron retorts and furnaces combined for making charcoal; also steam pumps. Ohio.

1,023. Ammonia machinery. Georgia.

1,024. Prices on machinery to manufacture cheap furniture, sash, doors and blinds. Georgia.

1,025. Shafting, pulleys, emery wheels, blast blowers, tuyere irons, etc. Alabama.

1,026. A heavy power mortiser, seven-inch four side molder, and a shaper table. Virginia.

1,027. A 40 H. P. engine and boiler. Virginia.

1,028. Steel, iron and slate roofing. Virginia.

1,029. Bids for the erection of 25 bee-hive coke ovens. West Virginia.

1,030. Spoke and handle machinery; also wood splitting and hand saw machines. Georgia.

1,031. A second-hand 36-inch gauge engine, weight 12 to 16 tons; also four logging cars, and two miles of 20 to 30-pound iron or steel rails. Mississippi.

1,032. A mill to grind guano. Virginia.

1,033. A 6,000-gallon tank and pump. Georgia.

1,035. A powerful steam dredge for sand and hard clay, for dredging a canal through Mustang Island, Texas.

AMERICAN GOODS WANTED ABROAD.

994. Catalogues, price lists, etc., of electrical lighting and motive power machinery. Mexico.

995. Shoes, dies and other fittings. Mexico.

996. An 80 H. P. Corliss improved engine. Mexico.

997. Small ice machines for family use. Mexico.

1,005. Contractors wanted for rebuilding 1,500 houses in iron and brick, which latter is made here. Martinique.

1,008. Prices and particulars of a plant for a meat canning factory. Canada.

1,009. Prices and particulars of a plant for a beet sugar factory. Canada.

1,010. Prices and particulars of a plant for a tannery. Canada.

1,034. Agencies wanted of American goods. Australia.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including August 6th were as follows:

	Tons. 1890.	Tons. 1889.
Marquette, Marquette District	705,063	785,522
St. Ignace, " "	15,911	25,255
Gladstone, Marquette District	6,183	519,089
" Menominee "	28,837	10,366
Escanaba, Marquette "	692,015	16,195
" Menominee "	1,075,832	883,450
" Gogebic "	*150,787	153,932
Ashland, " "	*1,116,090	841,900
Two Harbors' Vermillion District	456,700	486,863
Total, tons	4,245,418	3,722,572

*To July 30 only.

ALABAMA.

COOSA COUNTY.

(From our Special Correspondent.)

A stock company has been organized, and purchased about 1,700 acres of land near Kellyton, with a view to developing the same, opening coal mines and stone quarries, establishing lime works, etc. The parties are from Birmingham and Dadeville.

CALIFORNIA.

AMADOR COUNTY.

PLYMOUTH CONSOLIDATED GOLD MINING COMPANY.—The secretary of this company, in a letter to the stockholders issued on the 13th inst., submits the following financial statement to August 1st:

Surplus January 1st, 1890		$28,141.42
Gold bullion produced March		2,969.90
From Utica Mining Company for use of mill		542.52
Wood sold		1,004.00
Gold bullion produced April		5,055.63
" " May		6,040.37
" " June		7,572.05
" " July		5,649.93
Copper plates melted up		1,770.95
Total		$58,746.77
January Expenses	$3,975.05	
February "	3,762.57	
March "	4,293.19	
April "	5,075.63	
May "	6,443.17	
June "	5,961.37	
July " Estimated	6,000.00	
		$35,510.98
Surplus		$23,235 79

During July the mill was run mostly on the low grade rock of No. 3. Only about 15 per cent. of the quantity crushed came from the better rock of No. 2. The sulphurets are yet to be added to the amount given, increasing it to something over $8,000.

There is very little change to note in the mine. The superintendant reports that the ore body on No. 2 has widened a little and looks well.

MONO COUNTY.

(From our Special Correspondent.)

HECTOR, Aug. 4.

Mono Lake, the Dead Sea of California, 40 miles by trail from Yosemite, has great medical properties. Near it are unlimited water power and plenty of timber, with a variety of all the leading metals. It is the very best place for a mining school on the scale of those at Falund, Swansea or Hiedelberg. I have drawn Senator Stewart's attention to the matter, who is in favor of it.

BODIE AND MONO.—These mines, under Superintendent John Kelley, are working the usual number of men, and may be heard from any day.

HOMER DISTRICT.—Pierce & Butterfield mill has started up on May Lundy ore. Parot's arrastras are running on ore from the Grand Prize mine. The Golden Prince is waiting for a packer to bring the ore to mill, and the Clifton, after a small crushing, is taking out ore again. All these mines, except the May Lundy, are operated by the owners.

STANDARD.—This mill has been running since the 22d ult., and is so far proving a success. The light-running Frue concentrators take the place of the cumbersome pans, with their wear of iron, large power and extra labor. It is understood that an electric light plant is in order for the mine and mill. Evidently Mr. Arthur Macy knows his business and intends to avail himself of all the latest improvements. The success of the Standard insures the starting up of the Bodie Tunnel mine, and there is no good reason why the Noon Days, owned by Messrs. Haggin & Carr, should not do the same.

NEVADA COUNTY.

EAGLE BIRD MINE.—In the case of Francœur vs. Newhouse, involving this mine, a jury in the United States Circuit Court at San Francisco returned a verdict in favor of Newhouse & Co. and on the mining side of the case. The suit directly involved mineral land valued at from $150,000 to $200,000, and indirectly land valued at more. The jury was of the opinion that the land in question was known to be mineral land at the date of the filing of the map of general location of the route of the railroad since August, 1862, continuously down to the present occupation by the defendants. The plaintiff purchased the title from the railroad for a few dollars an acre.

NORTH STAR MINING COMPANY.—The ore comes out of the stope on the west drift of the No. 17 level of this company's mine continues to be of good quality, the gold being coarse and intermixed with sulphurets. This quartz, when first struck, came in a narrow streak, but subsequently widened until it was 10 inches, and ribboned with bands of gold and sulphurets. There has been more ore taken out not so rich in appearance.

COLORADO.

BOULDER COUNTY.

Grant Island District.

(From our Special Correspondent.)

There are many mines in this district that only need small capital and careful working to be made producers. The camp has had the usual drawbacks of high figures and the wonderful knowledge and *backcapping* of would-be experts and bonanza owners.

BELCHER.—This mine is being worked by Wm. Irwin, and is now shipping from the dump at a profit.

GRANT.—This property is being cleaned out, preparatory to working it extensively.

MOUNTAIN WITCH.—This mine, near the Sovereign People, will start up in a short time to develop and open up. It is under lease and bond to Snelson & Bryant.

NONPAREIL.—The owners are taking out the water preparatory to working. It has also produced some very high grade ore. A cross tunnel is being driven in to cut the vein on Idaho hill, and when completed will add great value to the mine. This tunnel will practically drain the whole hill at a depth of about 300 feet.

POTOSI.—This mine has some good ore exposed, but is not regularly shipping as yet. It has a very strong vein of a good grade of ore, and if properly developed will show as well as any mine in the district.

SHERMAN.—This property, under lease, made a shipment of about 12 tons of ore the past week. The Sherman is parallel to the famous Poorman, and has always paid, the grade being high. The lowest working depth is about 300 feet.

SOVEREIGN PEOPLE.—This mine, worked by W. H. Snelson, has grown to be a steady producer of a good paying ore that is being shipped in two classes only, No. 1 averaging 187 ounces silver, $\frac{75}{100}$ gold, and $10\frac{45}{100}$ lead; No. 2 $59\frac{87}{100}$ silver, $\frac{80}{100}$ gold, 2 per cent. lead. The vein is about one foot in solid mineral and ranges from six inches to two feet in thickness. The No. 1 ore is a fair average of the one foot streak.

WIGWAM.—The management of this mine, about which so much excitement was created a year ago, is putting in machinery for sinking of shaft and other development. This mine has produced ore that ran as high as 11,000 ounces in silver.

GILPIN COUNTY.

CLAUDIA J. MINING COMPANY.—The recent strike at this company's property seems to be attracting some attention. The new vein discovered is turning out good ore, and the vein has hardly opened yet. It is reported that the lode is strong, and that from indications the ore body is a deep one. Secretary Adams says in his report on the property for July: "We have moved our hoisting apparatus to the new discovery and got it in place on the 23d ult. and commenced hoisting ore on the 24th. We have sunk the shaft 25 feet and then drifted 25 feet east, and find the ore body 2 to 3 feet in width, solid, and increasing in thickness as we drift east. We are hoisting a cord of ore daily, the weight of which is between 7 and 8 tons, and will put on more men as fast as we can make room for them to work. This vein runs parallel with the Claudia J., which will enable us to cross-cut from shaft No. 2 or 3 and give us large stoping ground."

HINSDALE COUNTY.

(From our Special Correspondent.)

LAKE CITY, July 26.

This county was organized in 1874, and in 1882 the Denver & Rio Grande railroad commenced to build a branch line to Lake City, which was completed August 15th, 1889. The town is situated upon the Lake Fork of and about thirty-five miles from the Gunnison river, and the same distance from the main line of the Denver & Rio Grande railroad.

The ore-producing districts of Hinsdale County are mainly tributary to Lake City. Hensen creek heads up in Engineer mountain, a distance of twenty miles from Lake City, and has upon its banks many undeveloped mines.

The Lake Fork of the Gunnison heads about twenty-four miles from Lake City, and on both sides of the stream, as on Hensen creek, are high mountains, containing true fissure and well-defined veins, as much as any part of the Rockies that your correspondent has visited. The ores contain gold, silver, copper and lead; some of them carry zinc, but not enough to be at all detrimental in treatment. Some indications of deposits can be found on Engineer mountain and at Carson Camp. High grade mineral has been shipped from both of these sections, and at Carson constant mining and shipping is in progress. There are about eighty mines in this county that have profitably shipped ore in the past, and if the Eastern owners of patented properties that they have allowed to remain idle since the failure of Crooks Works at this point could be made to appreciate the situation, and would visit their mines, unpack the machinery that was shipped to Lake City years ago, put that and some of the practical miners who are not afraid to try again at work, they would soon find that their old veins and dumps will pay, as even does the "slag pile" worked by Buckle Bros., surrounding what is left of the Crook Bros.' formerly magnificent plant. This section has had its backward turn on account of the prominence given to its notable non-success in treatment, but if that old slag pile can be made to pay now, how will it be with the great quantities of ore in sight and on the dumps.

I predict that within two years the output from Lake City in tonnage and value will be larger than ever before. They certainly have the mines, one of the finest water powers in the West, placer for the tourist, hunter, fisher, miner, and prospector, and it is a wonder to me that capital should have allowed these mines to remain idle so long. They are agitating and testing new processes, the question of low rates on low grade ores and new life and energy will soon alter the aspect of matters.

OCEAN WAVE.—This property, formerly a large producer, above the Ute & Ulay, is preparing for work, and Mr. Drennon, Jr., says that when his father returns from the East they will soon be in shipping condition again.

UTE AND ULAY MINING COMPANY.—A wealthy company owns, and is carefully developing, under the able superintendency of Mr. H. E. Armitage, the Ute and Ulay properties, the deepest workings of this whole section, some seven hundred feet in depth, being upon the Ute. The company is running a tunnel of 1,500 feet, and at about seven hundred feet tapped the second ore chute, that so far shows over one hundred thousand dollars worth of ore, much richer in gold and silver than the first ore chute that yielded many thousands of dollars profit. The very plant, built under Mr. Armitage's personal supervision, to treat the ores from these mines will soon be completed, and will not be surpassed by any in the State, so that when the company commences stoping the concentrates will command a ready and profitable sale.

GEORGIA.

(From our Special Corres pondent.)

BARTOW COUNTY.

ETOWAH IRON COMPANY.—This company has been incorporated by Messrs. A. O. Granger, J. M. Gazzam and J. M. Africa for the purpose of building furnace, mining ore, etc. The capital stock is $1,500,000. Some mention of Captain Granger's success in this section in mining has been made in a recent issue of the ENG. AND MG. JOURNAL.

CHEROKEE COUNTY.

LA BELLE GOLD MINE.—It is reported that Mr. H. F. Turner, of Atlanta, is going to open up and develop this mine; we are pleased to see this, as the last reports from the property were made by a man claiming to have been working it, and to have taken out the modest sum of 12,000 dwts., which turns out to be very far indeed from being correct. Such misstatements tend to do a property harm, and it is to be hoped now that the management has changed, good results will follow.

LUMPKIN COUNTY.

THE DAHLONEGA COMPANY, LIMITED.—This company has been having some trouble during the absence of the manager, Mr. A. B. Linderman, in regard to payments for machinery, etc. Upon his return, however, arrangements were at once made to resume work, which indicates that the difficulty will be easily settled. Mr. Herbert has been running the Singleton, one of the properties under the management of Mr. Linderman, under lease so that it has not stopped during the trouble.

POLK COUNTY.

One of the engine houses of Begelow & Barton's ore washers was burned on the 1st. It burned down to four kegs of powder and some dynamite underneath it, when an explosion took place causing the entire structure to burn. The damages amount to about $1,000; the report was tremendous and it is fortunate that no lives were lost. The cause of the fire is unknown. This washer was at the Reed Bank, recently described in the ENG. AND MG. JOURNAL.

MICHIGAN.

(From our Special Correspondent.)

MILLIE MINING COMPANY.—The property of this company is adjoining the southeast corner of the Chapin, and in the so-called Chapin foot wall. The mine was formerly called the Hewett. It is now operated by D. G. Dessau, of New York, who owns a controlling interest. The deposit consists of small lenses of ore, running 63 per cent. in iron and from ·018 to ·03 in phosphorus. The ore formation has a dip of from 90 to 80 degrees, and an average width of 20 feet. The openings consist of two shafts, B being 90 feet and C 300 feet deep, and four levels. The output in 1889 was 20,000 tons; up to the present season it has been 71,491 tons. The estimated output of 1890 is 30,000 tons. C. W. Kennedy, Iron Mountain, is the superintendent. One hundred and seventy-five men are employed.

PEWABIC MINING COMPANY.—This company formerly called the Menominee, is located in [illegible]

north half of section 32, town 40, range 30, being west of the Walpole, and, it is believed, on the Chapin formation. Operations have been in progress on this property since May, 1887. Up to the present time a shaft 500 feet deep has been sunk. In this distance it passed through 150 feet of sand rock. Drifts have located the ore 200 feet north of the shaft; from present openings it is found to be 47 feet wide. Three levels have been opened. A drift to locate a second shaft has been run 700 feet east. Operations have been greatly retarded by the presence of water. The ore is a fine quality, being similar to that of the Lake Angeline on the Marquette range. It runs from 64 to 65 per cent. in iron and ·01 per cent. in phosphorus. There has been no output in previous years. Up to the last of July this year 10,000 tons were shipped. The management will make no estimate as to the number of tons which will be put out this season. E. T. Brown, Iron Mountain, is the superintendent; Messrs. Van Dyke, Conro and Hulst, Milwaukee, principal owners.

IRON.

(From our Special Correspondent.)

JAMESVILLE, WIS.

SCHLESINGER SYNDICATE.—The name of Ferdinand Schlesinger, of Milwaukee, has during the past season become inseparably connected with the non-Bessemer iron ore mining industry of the Lake Superior region. This gentleman is at the head of the Schlesinger Syndicate which owns and operates the Chapin, Florence, Iron River, Claire, Yorkstown, Dunn, and Armenia mines of the Menominee range, and the Queen, Prince of Wales, Buffalo and South Buffalo mines of the Marquette range. It is understood from inside sources that this syndicate has contracted to furnish 2,000,000 tons of ore this season, and that up to August 1st the contract had been more than half filled. Not only does the syndicate operate its mines, but it owns and runs its lake carriers, and is now constructing a railroad from Escanaba to Iron Mountain for the purpose of handling its Chapin ore. Fifty-two miles of this line are under construction. The roadbed is nearly completed, and by the opening of another spring it will be tracked and ballasted. The Milwaukee & Northern railroad will lay the rails and operate the line. In addition, the syndicate now has under construction at Escanaba a dock of 25,000 tons storage capacity, and capable of handling 1,000,000 tons of ore per season. It will be ready for use in 1891. The road will be in full operation at the opening of next shipping season. In addition to the 52 miles now being constructed a line has been run from Iron Mountain to Crystal Falls, a distance of 58 miles, tapping the remaining mines of the syndicate on this range. This line will be the next to be constructed. The supposition is that a branch line will be run from a point between the Ford and Escanaba river to some point on the main line, with a branch tapping the four syndicate mines at Negaunee. The operations of this syndicate show that it is placing its property upon a permanent working basis, and that it has faith in the non-Bessemer ore market.

THE CHAPIN MINING COMPANY.—The property of this company lies as the S. ½ of the S. W. ¼, and the S. W. ¼ of the S. E. ¼ of sec. 30, town 40, range 30, lying within the corporate limits of the city of Iron Mountain. The ore deposit so far is known, and it has been quite extensively opened, consists of a continuous lense, which, from its extent, regularity of occurrence and purity of ore, might be called a vein. It runs nearly east and west, a little north of west and south of east, across the three forties above described. It is capped by a drift varying in thickness of from 15 to 100 feet. The width of this lense will average 70 feet. The walls are distinctly marked, the foot being a red, friable slate; underlying and in the order named are found the lean ore, greenstone and granite. The hanging wall is gray slate, overlaid by limestone and Potsdam sandstone. The dip of the lense is from 70 to 80 degrees north. Although its course across the property lies near the northern boundry, the direction of the dip, the angle is so near the vertical and the deposit so extensive that the mine can maintain its present immense output for many years to come. It is a well-known fact that there is a 30-years' product in sight at the present day. The lease of this property, together with a two-thirds interest in the Hydraulic Power Company, was purchased in 1889 by the Schlesinger Syndicate, of Milwaukee, for $2,000,000. The mine at the present day is pronounced to be well worth double that amount. The fee is held by Henry Chapin, of Niles, Mich., who receives a fixed royalty. The mine is an old one, having produced since 1880. Up to last season it produced 2,226,000 tons; last year the output was 542,000 tons; this ore runs 62 per cent. in iron and from ·075 to ·08 per cent. in phosphorus.

It has been a problem calling for a great expenditure and requiring all the skill of a competent management to determine the best means of handling this large deposit of ore. The walls are a soft, friable, unstable slate which disintegrates on exposure, making the openings very unstable and costly to maintain. In mining down to the fifth level pillars were left. In opening up the sixth level it was decided to adopt a new system, that of rock filling, carrying the stope across the formation and leaving no pillar. Under the old system a tunnel was run in the foot wall of the rock parallel with the ore; the ground was blocked off in sections of 50 feet each. A drift was made through each end of the blocks to the hanging, and a rise made through the foot wall near the ore to the cross cut above. This rise was for the rock filling which was dumped in from above. The stoping was begun at the further side against the hanging wall, the full width being carried south to the tunnel. The ore was trammed out below. The pillars from the fifth level up are now being drawn in this way: Crosscuts are made south from the hanging wall shaft to the foot. Main drifts are cut along in the foot parallel to the ore. From this foot wall drift crosscuts are made through the pillar north to the hanging. A track is made in this crossdrift and a rise made in the rock to the level above. Stoping is begun at the north end of the pillar, the full width being 20 feet, and the height 9 feet; as soon as the ore is taken out the space is filled with rock. In this manner the mine is being rapidly filled in its different stopes from the bottom to the top.

There are six shafts opening into the deposit. "A" shaft is at present used as a waterway. It is located at the east end of the property and in the foot wall. It is divided into a hoisting compartment and two compartments for the double plunger Cornish pump, which hoists 2,000,000 gallons of water every 24 hours. This pump is operated by a double 24-inch by 48-inch Corliss engine. "A 1" shaft is 300 feet deep on the angle of the lense. "B" shaft, the deepest of the mine, being in length 630 feet, and "C" shaft, 775 feet to the west, are both two compartment vertical shafts located in the hanging wall. They are operated by separate plants, each consisting of a double Corliss engine, 30-inch by 60-inch, operating two 10-foot by 15-foot conical drums. The balance-cage system is used in each, and two tons are hoisted at a lift. These are the principal hoisting shafts of the property; at the time of the writer's visit, the last of June, "B" shaft was hoisting 300 and "C" shaft 1,400 tons daily. "No. 2 Timber" shaft, a new, five-compartment shaft, is 600 feet west of "C" shaft, 200 feet in the footwall and 370 feet deep. It is operated by a single Corliss engine, 18 by 42 inches, and four five-foot drums. "D," better known as the "New pump shaft," is in the foot wall, 1,100 feet east of the west line of the property. It has been sunk a distance of 190 feet, 96 feet being through sand, of which 30 feet were quicksand. In passing through this latter formation the Poetsch-Sooysmith process was successfully used. The shaft is now into the ledge. A drift has been run under it from "C" shaft at the fifth level, or 230-foot point, and a winze holed. This winze is to be widened and timbered into a shaft. The shaft, which is a four-compartment, is to be made the water shaft of the mine, replacing the one in present use at the east end of the property. It will also be used as a rock hoist. During your correspondent's visit a 23-foot rock and concrete foundation was being laid for a 36 by 42 by 71 foot engine house. This building is designed to hold the new Cornish plunger pump engine. This piece of machinery will possess an initial cylinder of 50 inches and a secondary of 100 inches; the stroke will be 10 feet and the number seven to the minute. A shaft house 100 feet high is also to be erected at this shaft. The hoist will be a Corliss plant equal in size to any on the location.

As to the different openings of the mine, six levels have been opened up, a cross-cut driven from every 100-foot point of each shaft, either to the north or south, according to the location of the shaft with respect to the foot or hanging wall. An open pit 350 by 160 feet adjoining the west end of the property was made this season by the removal of about 25 feet of drift, for the purpose of getting at a section of the lense more readily. The lense was found clearly defined, but so badly mixed with lean ore that it became necessary to sink into it instead of mining it from the surface. Four short shafts are now being sunk from the bottom of the pit. It is expected that as the deposit is penetrated the ore will be found to average with the other portions of the mine in purity.

The line of development at present mapped out by the management is to sink "C" shaft from the 580 to the 630 foot point; to sink "B" shaft to the 730-foot point and to continue "No. 2 Timber" shaft from the 330 to the 575-foot point. An underground tramway three-fourths of a mile in length, located on the sixth level, greatly expedites the tramming of rock. It is worked by an underground engine. Provision has been made at the surface cable plant for working tramways at the seventh and eighth levels when their need shall be felt.

At the surface everything bespeaks a wealthy mine and a judicious management. The different buildings are substantial and commodious; those containing machinery are constructed of stone or sheeted with corrugated iron. A most convenient system of tramways exists for the rapid and easy handling of ore. The system comprises lines of about two miles in length. The tracks are nearly all double. The motor power is a series of endless cables. These tracks reach in every direction from the stone quarry, where extra filling is obtained, along the shaft houses to different portions of the immense stock pile or to the ore pockets. The cars are dumped by being run into a frame which has a cylindrical motion, its axis being lengthwise of the car. In the loaded car, the center of gravity is near the top and the frame is easily tilted. When empty the center of gravity is brought close to the track by the weight of the car wheels, and the car regains its original position automatically.

As auxiliaries to this great mine may be mentioned a 30-light Brush dynamo, a saw-mill for framing sets; a warehouse 40 by 150, now being constructed; machine, blacksmith and wood working shops, commodious, dry; four miles of switch-track, Chicago & Northwestern and Milwaukee & Northern railroads; a quarry where filling is obtained, and two steam shovels.

One of the greatest features of the mine, its motor power, is all derived from the Hydraulic Power Company's plant, located 2·9 miles away, on the Menominee river. One thousand four hundred horse power is developed from this source at the plant, a description of which will be given in a future issue of the ENGINEERING AND MINING JOURNAL. The company works the following cylinders: 4 (30×60), 2 (24×48), 2 (18×42), 14×36, 5 12×36), 10×30, 18×24, 10×16, 9½×12, 2 (10×10), 6×10, 6×12, 8×12, 4 (12×12), 7×10, 6⅓×8, 10×15, 6½×6, 2 (5×6), 6+6.

On the day of your correspondent's visit to the mine it was running full force, and these different cylinders, excepting one pair, 30 × 60 and in addition about 75 No. 3 Rand drills, were run by air furnished by this plant. The company has on hand a full complement of boilers for use in case of emergency.

The output this season will be 750,000 tons. Most of it is being shipped to Escanaba.

MINNESOTA.

ST. LOUIS COUNTY.

(From our Special Correspondent.)

MESABA RANGE, Aug. 12.

LONGYEAR MESABA COMPANY.—This company is operating a diamond drill on its property in 59-14. A vertical hole has been drilled 700 feet in slates and quartzite.

MALLMAN MINE.—This property, in 59-14, is being thoroughly explored. There are 14 men in the camp. Test pits have been sunk along the iron formation for a considerable distance. These pits show the vein to be about 150 feet wide at the surface, with a length as yet undetermined. The foot wall is quartzite; the hanging wall is black slates. Two prospect shafts have been sunk in the foot wall on the angle of the deposit, which is about 50 degrees, to a depth of 50 feet.

Another shaft was sunk vertically in the hanging wall near the contact with the vein material, to a depth of 57 feet. This shaft was bottomed in ore, and was stopped on account of the pumping facilities not being adequate to keep out the water. It is intended to resume operations in this shaft as soon as a new boiler and larger pump can be put in.

No. 4 shaft is the only one now being worked. This was sunk vertically, in the ore formation, and is down 25 feet.

The ore is a soft hematite with five or six feet of hard ore between it and the Jasper capping, which is 10 to 15 feet thick. An assay of a sample from No. 2 shaft showed 66 per cent. metallic iron.

Mr. Mallman intends to begin operations soon at a new camp, 1½ miles southeast of the present camp, on a continuation of the same formation that he is now exploring. Some Ashland parties have recently bought a large interest in the Mallman property.

MOUNTAIN RANGE IRON COMPANY is perhaps the most prominent of these, and is doing considerable work, a diamond drill having just been started.

STONE IRON COMPANY.—Capt. Bice, of Iron Mountain, Mich, has recently been put in charge of the explorations on this property, and is working 14 men. Considerable test-pitting has been done, but at present work is confined entirely to the sinking of a shaft, which is down 84 feet vertically, in mixed ore and soap rock. The company is troubled with an excessive amount of water in the shaft, and two large pumps are kept constantly at work.

A great deal of interest is being taken in the country about thirty miles west of Mesaba, along the proposed line of the Duluth & Northwestern Railroad, and a number of exploring parties are out.

VERMILION RANGE.

MINNESOTA IRON COMPANY.—The total shipments of iron ore for the month of July was 87,000 tons.

A larger boiler and hoisting engine are being put in place at No. 10, and a skip road is being built over the side of the pit. The shaft will be abandoned, and all the ore will be hoisted with the skip.

In No. 5 pit the work of filling up and back stoping has been commenced in the second level east. At No. 9 an attempt will be made to mine another level in open pit, and a gang of men is at work making the walls safe. This will make the open pit 300 feet deep.

The sinking of Alaska shaft will be resumed shortly. It will be put down 100 feet further, making the total depth 330 feet, the diamond drill having shown a considerable body of ore at that depth.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, Aug. 11, 1890.

The zinc ore market still continues weak. Holders of high grade, clean ore in large quantities were paid $25.50 per ton during the week ending Saturday, but most lots were sold at lower prices, averaging about $23 per ton. The zinc smelters certainly still hold the key to the situation, and the prices no doubt will continue low until the present smelting capacity is increased. Following are the sales from the different camps:

Joplin mines, 1,384,040 pounds zinc ore, and 156,000 lead, value $20,162. Webb City mines, 1,245,380 pounds zinc ore, and 43,840 lead, value $14,505.65. Carterville mines, 685,650 pounds zinc ore, and 21,640 lead, value $7,780,53. Zincite mines, 226,920 pounds zinc ore, value $2,818,62. Lehigh mines, 91,000 pounds zinc ore, and 2,360 lead, value $1,196,75. Oronogo mines, 60,000 pounds zinc ore, value $7,20. Galena Kaus mines, 1,019, 530 pounds zinc ore, and 97,000 lead, value $12,080. All districts, total value $59,263,55.

J. W. McMillen has organized a company at Independence, Mo., to open up a mine in East Hallow.

L. C. Wilmoth & Co. sold recently to a Kansas City party 120 acres of undeveloped land 2½ miles north of the city. The consideration paid was $100 per acre.

Marks & Co. operating on the Thucker land in the north part of the city opened up a fine body of lead and zinc at a depth of forty feet.

Judge O. N. Hilton, of Deaver, Colorado, who has opened a real estate and mining broker's office here, purchased a one-third interest in a mine on the Snyder Bros.'s lease that is now paying $600 per week net profit, with no machinery except a horse hoister and hand jigs.

The great demand of the Joplin district at the present time is a large zinc smelting plant, and it seems stange that the largest smelting plant in the world is not now being erected at this point. Many schemes have been formulated but do not materialize. The mines can furnish the ore and the numerous railway lines can supply the coal. Judge W. W. Van Ness, of Dalton, Ga., has spent several days in looking around among the lead and zinc mines.

DIAMOND.—The jigs were run only about two and a half pays last week. A good strike was made in shaft No. 1, and the miners are cutting on a face of 16 feet of lead and zinc ore.

HENDERSON LAND AND MINING COMPANY.—The Kansas City Syndicate which recently purchased 3,000 acres of land from E. B. and J. M. Leonard and R. I. Henderson on Lost Creek, near Senaca, Newton County, has organized a stock company under the above name, with a capital stock of $100,000 divided into 1,000 shares of $100 each. The tract of land is undeveloped, but is said to be well located, and shows surface indications of lead and zinc ores.

LEHIGH.—S. A. Stuckey is still prospecting the Knight land with a drill and has struck lead and zinc ore at a depth of 106 feet which continued to a depth of 133 feet. This proves up a body of 27 feet of ore.

Haley and Kochtitzky are opening up a good prospect on the old Cherry Tree ground at a depth of 55 feet.

PETRE.—This property on the Empire ground is running along smoothly, and last week produced 164,070 pounds zinc ore and 11,370 lead.

SNYDER BRO.'S MINES.—This property on the Allen land broke the record again last week by producing 463,290 pounds zinc ore and 23,640 lead; six months ago this was an undeveloped tract of land and could have been purchased for less than $10,000; now the owner refuses $100,000.

WHITE ELEPHANT.—This mine is now opened up in first-class shape and was the first to put down an incline shaft whereby the ore is hoisted from the mine in cars and dumped on the platform.

MONTANA.

LEWIS AND CLARKE COUNTY.

MONTANA COMPANY, LIMITED.—The directors of this company, under date of the 31st ult., have issued a circular to the shareholders, in which they say that they regret to find, from Mr. R. T. Bayliss's last report, that the monthly returns for the current half year will probably be less than were anticipated. They desire to point out that the exploratory work and developments necessary to enable the extraction to keep well ahead of the milling requirements must require considerable time, and although it is satisfactory to note that the ore bodies opened up during the past few months have added materially in quantity to the reserves, it is evident the amount of high grade ore in sight is not sufficiently large to justify the management in drawing upon it too heavily. Mr. Bayliss reports: "While I am more than content with the developments which have been made during the past six months, it is evident that our low grade reserves are far in excess of the available high grade. It may be considered that practically all the reserves come under the head of low grade; 'and as it would be imprudent to draw heavily and unequally upon these high grade ore bodies until further resources have been developed, I have instructed Mr. Henley not to make undue exertions for the purpose of maintaining the returns at or near $100,000, and to work only for the best possible results to be attained without drawing excessively on the Empire and the 1,000-foot level ore body. I think that until further developments increase our reserves of high grade ore, this extraction of high grade is as large as circumstances warrant. The result will probably be that the returns for the next few months will be about $80,000, more or less; but we hope by the end of the year the facilities which will be offered us for the development of the Empire mine, as soon as the connection with the 400-foot level is complete, will enable us to add to our resources in that mine such further tonnage of ore as will justify us in extracting larger quantities of the reserves now in sight than we feel warranted in doing at present. It is hardly necessary for me to remind you what an uphill task it is to increase the quantity and value of our reserves in conflict with 120 stamps crushing upward of 90,000 tons a year, but we are confident we can do so and no effort will be spared to achieve this result."

The Secretary of the company, under date of the 5th inst., also states that the following information has been received from the resident director of the mine:—

Total weight of ore crushed during July	7,198	tons
Yield from the three Mills	$75,700	
Working Expenses for the Month	$58,800	
The estimate number of ounces contained in returns by assay being	Gold 2,307	ozs.
	Silver 21,705	"

MADISON COUNTY.

WASHINGTON BAR GOLD MINE.—A press dispatch says that an English syndicate has announced its readiness to purchase this mine. The London promoter of the enterprise has cabled the mine owners to send their attorney to make the transfer. The Hon. Charles B. Benedict, of St. Paul, Minn., is on his way to Europe for the mining company. Most of the proprietors live in Minnesota. The consideration is not known.

NORTH CAROLINA.

MCDOWELL COUNTY.

(From our Special Correspondent.)

IDLER GOLD MINING COMPANY.—As was mentioned in the ENGINEERING AND MINING JOURNAL of the 21st of June, this company has been organized in Boston with a capital stock of $1,000,000. The company is to erect a mill and operate it in conjunction with chlorination works, also under consideration for erection.

PENNSYLVANIA.

COAL.

A press despatch says that fire still rages in the Hill Farm mines, near Dunbar, where the fire-damp explosion occurred a short time ago and killed 31 men. The mine was opened on the 13th inst. for the first time in five weeks and the fire damp was so dense as to make entrance impossible. Two large fans have been erected, which will be kept in constant operation until the fire is extinguished. It is estimated that the fire has already done $100,000 worth of damage.

The Dodge Coal Storage Company is erecting a coal storage plant of 310,000 tons capacity at South Plainfield, N. J., for the Lehigh Valley Coal Company. This plant will consist of 14 conical storage piles of the following capacities: Six piles of 30,000 tons each; 4 of 20,000 tons each; 2 of 15,000 tons each; 2 of 10,000 tons each.

The Lehigh Valley Company's plans cover a plant of 60 conical piles, having an ultimate storage capacity of 1,380,000 tons. The machinery for the remaining 46 storage piles, with a capacity of 1,070,000 tons, it is expected, will be erected within the coming two years. The location of this plant would seem desirable, being at the junction of the main line from New York, with the Perth Amboy branch.

PHILADELPHIA & READING COAL AND IRON COMPANY.—General Coal Agent T. M. Richards announces that the following collieries of this company have suspended operations for the present: Kohinoor, Girard, North Franklin, Eagle Hill, Middle Creek, Glendower and East Franklin. The suspension is the customary shut down on account of the midsummer dullness of the coal trade.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to August 8th, were as follows:

	1890. Gals.	1889. Gals.
From Boston	1,811,511	3,049,489
Philadelphia	88,019,550	83,908,885
Baltimore	6,680,364	3,066,195
Perth Amboy	8,874,596	11,648,290
New York	244,038,402	258,626,593
Total	349,424,423	360,299,452

The chief of the bureau of statistics reports the total values of the exports of mineral oils the United States for the months of July, 1890 as compared with similar exports during the corresponding periods of the preceding years as follows: July, 1890, $4,825.268; July, 1889, $4,600,906; seven months ending July 31st, 1890, $26.473,894; seven months ending July 31st, 1889, $28,187,483.

SOUTH CAROLINA.

LANCASTER COUNTY.

(From our Special Correspondent.)

HAILE GOLD MINE.—The recent fire at this mine, as has been noted in the ENGINEERING AND MINING JOURNAL of June 14th., destroyed the hoisting plant, so that the mill had to be stopped for three weeks; the chlorination went on with increased activity, however, as there was a large reserve of concentrates on hand. A temporary hoister was put up so that the mill started up again on the 21st.; the necessary arrangements were at once made to put everything baek into good running order; which is easily accomplished as the heavy machinery was only slightly damaged on the outside fixtures. The new pan furnace for roasting was put in operation, and though it added considerably to the output for the month, some changes were found necessary that though slight would have added much more to it had they not been necessary.

The production of bullion was $9,105.44 as compared to $9,187.46 of the preceding month, which is a large increase considering that the present month's work (July) was short handed, being only the output of the chlorination for the whole month and the mill for one week.

SOUTH DAKOTA.

LAWRENCE COUNTY.

(From our Special Correspondent.)

RAPID CITY, Aug. 11.

IRON HILL SMELTER.—This is closed because, as I understand, the owners are awaiting the completion of the Blackhills & Manitoba Railroad into Deadwood to insure cheap coke from the new coalfields in Wyoming, the difference in present price and prospective price being sufficient to pay the company to shut down for about three months, when it is expected the railroad will be completed. A small force of men are kept at work in the mine, and a few days since an assessment of three cents a share was levied.

MONITOR.—There is one property in the Northern Hills, which, although one of the oldest gold-bearing quartz locations, has never created the stir or excitement the other belt properties have. I refer to the High Lode Extension, Goldfinch and Monitor lodes. The original location dates back to the summer of 1876, when a discovery was made and development work commenced. But it was not until 1878 that much actual work was done, or any amount of ore milled from these properties. The ore that was then milled was sent to custom mills, the price paid for crushing alone running from $4 to $9.50 per ton. This, added to the expense of mining and hauling, left but little or nothing for the mine owners. Notwithstanding such a disadvantage, the owners of these mines continued to take out ore which paid a profit, after the owners of the Hidden Treasure, Keets, Fairview, Wooley-Pecacho (all of which were located on the opposite side of Deadwood Gulch) had been compelled to close because of the low grade of ore. To-day the Monitor Company's property, as the High Lode extension and adjacent lodes are called, takes rank not only among the producing mines of the Hills, but among the dividend-paying ones. All the stock is owned by Black Hills men, and in a short time another five cents per share dividend will be announced, there being sufficient funds on hand to pay it; this will be the fourth in the past year. While the Homestake, Deadwood-Terra, Highland, De Smet and Caledonia companies have been crushing rock in the large mills, the Monitor has worked along in a modest manner, owning only the old McLaughlin & Cassel's 25-stamp mill (one of the first erected in the Hills). It varies in thickness from three and four feet to 18 and 20. When I visited these mines a few days since I found the main workings in a tnnnel about 1,000 feet long and 100 feet below the top of the hill. This tunnel crosses the High Lode extension, Goldfinch and Monitor lodes from southeast to northwest, and shows a face of ore exposed of nearly the entire distance of an average thickness of 12 feet.

In the chambers off from this tunnel, from which thousands of tons of ore, probably 80,000 tons in all, have been mined and milled, there is still left a large supply of the same ore now being worked. At the end of the tunnel, and in the chambers where ore is now being mined, a face of vein matter, or rather wall, is exposed 150 feet wide with an average thickness between cap and bed rock of at least 12 feet. Between the mouth of the tunnel and its face the bed rock has dipped nearly 30 feet. In the croppings on these properties more than one vertical vein was discovered which were afterward opened up by the tunnels on the High Lode Extension and Golconda—another claim belonging to the same company. But the cement body has so far supplied such an amount of ore that no attention has been paid to developing the vertical veins. It is reasonable to suppose that from the direction of these veins they are continuations of some of the other belt veins found in the Caledonia and Homestake properties.

Of the other producing mines in the northern Hills little can be ascertained beyond the fact that the mills are all kept running steadily; every two weeks the clean-ups are made, and the bullion shipped.

PIERCE.—This mine was bonded sometime since,

and is now shut down. From reliable authority I learned that a body of good ore was struck just before work was stopped by the holders of the bond. This mine is opposite the Homestake and Old Abe properties, and much work has been done on it in the past without gratifying results. Reports say that the holders of the present bond will, after purchase, pursue the policy of working at greater depth, and that a large mill will be erected in Deadwood for reducing the ore.

TENNESSEE.

POLK COUNTY.

(From our Special Correspondent.)

It is reported that the copper mines of this county have been leased and will be opened and worked this fall. The Burra Burra and Consolidated properties are embraced in the deal, and their furnaces will be changed from charcoal to coke. These mines were operated on a large scale before the war.

UTAH.

GRAND COUNTY.

GREEN RIVER OIL COMPANY.—This company has been organized for the purpose of exploring and boring for oil, refining and selling the same, and running pipe lines for conducting and shipping oil within the territory of Utah. The principal office is at Salt Lake City and the capital stock is placed at $1,000,000, divided into 100,000 shares of the par value of $10 each.

The trustees are: E. B. Wicks, J. L Haskell, W. H. Irvine, A. F. Holden and Hugh Anderson; president. E. B. Wicks; vice-president, J. S. Haskell. The corporation owns the four claims, situated in the Green River mining district, known as the Olive, Katie, Silent Friend and Lost Treasure, together constituting 640 acres of ground. It is the intention of the company to go to work at once and develop these claims.

Another company has been organized to work a property which comprises a number of claims aggregating 14,000 acres in area. They have at present a good flow of crude petroleum, and when wells are sunk they expect to strike a better quality of oil, judging from the oil now obtained. The parties who were sent to examine it report favorably. Mr. John F. Campbell, an experienced engineer and oil expert, is the discoverer and locator, and was instrumental in organizing the company. The gentlemen connected with the scheme are: Witcher Jones, J. C. Conklin, A. D. Elliott, of Salt Lake City, and H. T. Hall, of Green River.

SUMMIT COUNTY.

DALY MINING COMPANY.—The output of this company's mine for the first seven months of 1890 amounted to 6,316·16 ounces of bullion; sulphides, $295,110.70, and ore sales, $78,273.90. The company declared seven dividends, each of 25 cents per share.

ONTARIO SILVER MINING COMPANY.—The product of this company's mine for the first seven months of 1890 amounted to 554,188·82 ounces of bullion, and ore was sold to the value of $355,375.21. Seven dividends, each of 50 cents per share, were declared.

VIRGINIA.

(From our Special Correspondent.)

BUCKINGHAM COUNTY.

WHISPERING VALLEY COMPANY.—This company has been chartered for the purpose of purchasing land in Buckingham and Cumberland Counties, laying out town sites, mining coal, iron, copper, sulphides of iron and copper, and other minerals and metals, dealing in real estate, etc. The capital stock of the company is limited to $500,000.

LOUISA COUNTY.

ARMINUS COPPER MINES.—It is reported that an English syndicate has purchased this property for the sum of $500,000. The company is stocked at $1,2 0,000 and will develop the mines, and also erect reduction works at Mineral City.

FOREIGN MINING NEWS.

AFRICA.

Situated nine miles due south of Tafelkop Transvaal and some 15 miles north of Ventersdrop is a district to be surveyed shortly, as oil has been found there. The formation is Silurian, composed of metamorphic rocks, quartz, hard blue limestone, gravel and sandstone; and a seam of coal has been found in the vicinity. The formation is very favorable to the existence of petroleum in large quantities.

The indications consist principally of blue, oily matter floating on the surface of the water in great abundance, particularly on the western side, where this fatty, fluorescent, oily matter is very plentiful and extends into the pan some 50 yards.

This oily matter exudes from the soil, and the coarse grass on the ground is completely matted together with a thick coating of it. On the shore indications appear exuding from the earth in the form of a thin antifriction grease. This oily substance contains a hydrocarbon oil or petroleum, mixed with other matter. The surface indications are, in all respects, precisely similar to those existing at the Pennsylvania oil springs. The bottom of this extensive pan is composed of gravel and hard, stiff clay, covered with a thin coating of mud, and some of this mud sent to Dr. Hahn, of Cape Town, for analysis yielded a considerable percentage of hydrocarbon oil resembling crude petroleum, freely burning in a wick with a smoking flame.

Near Kimberly and over the line in the Orange Free State the Gilead P. Beck Oil Company has acquired a large area of land on which active prospecting is going on. Dr. D. P. Hahn, professor of chemistry in the South African College and the leading analyst in the colony, has distilled oil from "hachettin," an oil-producing shale, and obtained as high a percentage as 10 gallons of oil to the ton of shale. The oil is of a light yellow color, with a slight trace of benzine, non-fluorescent, and burns freely without refining. In neither oil nor shale did he find resultant of bituminous substance, tar, etc.

AUSTRALIA.

QUEENSLAND.

BROKEN HILL PROPRIETARY MINING COMPANY.—This company, of which Mr. W. H. Patton, who formerly superintended leading Comstock mines, is the general manager, had a net profit in its operations for the half year ended June 30, 1890, of $2,350,000, of which the shareholders received $2,320,000 in dividends. The total of dividends and bonus is $11,080,000. There is also reported silver bullion on hand unsold valued at $475,000, with supplies valued at $500,000.

BRITISH COLUMBIA.

(From our Special Correspondent.)

NELSON, Aug. 7.

Attempts are being made to bring about a revision of the mining laws of British Columbia. The laws are based upon those of the United States, but the clauses concerning placer and quartz mining are jumbled together and many of the sections are conflicting. In one respect, however, the law is liberal; *i. e.* in allowing an alien to record and hold mineral claims without becoming a British subject.

EAST KOOTANIE DIVISION.

BEAR CREEK.—Particulars are to hand of what appears to be an important strike on Prairie Mountain, about eight miles southeast of this place. One of the ledges is a fissure vein of considerable width—20 feet in places—and carrying well in copper. Four claims have already been located on the ledge. On the opposite mountain a contact vein between syenite and slate has been unearthed, averaging 10 feet in width and carrying galena ore. The galena assays well, running as high as $100 in silver and gold per ton. The locality is in close proximity to the Canadian Pacific main line.

HOT SPRINGS DISTRICT.

It appears that the purchase of the Number One and other claims in this district, mentioned in my last letter, was made by the Revelstoke Mining Company, Limited, organized in London, last January, with a capital of $200,000, for the purpose of buying and operating mines. This is a distinct company from the Kootanie Smelting and Trading Syndicate, which owns the smelter at Revelstoke, but it is under the same management, and the two companies will, of course, work hand in hand. All the ore from this district must go to Revelstoke, as things are at present, and the smelter company is fully prepared to increase its plant and erect refining works as soon as a sufficient supply of ore is assured. Why will not the United States repeal the duties on lead and copper, and thus benefit themselves and us? The Revelstoke Mining Company are developing its purchases, especially the United claim, and hope to ship 1,000 tons at least before winter sets in, provided the railway between Sproat and Nelson (now in course of construction) is ready for traffic.

KRAO.—In the ENGINEERING AND MINING JOURNAL of July 26, we read "the Krao was the mine that first attracted much attention to the camp. A shipment of $400 worth of ore from this property showed that the camp was not so low-grade as had previously been supposed." The second sentence should read, "A shipment of $400 ore (*i. e.*, ore worth $400 per ton), etc." Work is being done on the Krao, Skyline and a number of other properties.

ILLECILLIWAET DISTRICT.

PRIDE OF BAYSWATER.—This vein is from two to four feet wide, and carries quartz and grey copper ore. Assays of the sorted ore run from $600 to $1,900 per ton. Some $1,500 worth of work has been done on the claim.

SELKIRK MINING COMPANY.—The tunnel on the Lanark mine is now in 250 feet, and it is expected another 250 feet will have to be traversed before the vein is struck. If this development work proves satisfactory a wire-rope tramway will be erected from the mine to the Canadian Pacific track a distance of 2½ miles. Four hundred tons of ore taken out 500 feet above the tunnel and shipped to Omaha and San Francisco, yielded $80 per ton clear of all expenses. The Lanark is an extension of the Maple Leaf the claim bonded by Sir James Grant, of Ottawa for $80,000. The other claims which the company owns, or in which it is interested, look well, but very little work has been done on them.

SHAMROCK.—The vein can be traced the whole length of the claim, and is very wide, in places 40 feet wide. Nearly pure galena is found in pockets, assaying over 80 per cent. in lead and $95-100 per ton in silver.

NELSON DISTRICT.

CALIFORNIA.—The continuity for any great distance of the ore bodies on Toad Mountain has not yet been proven, owing to the heavy timber on the hill sides, and the amount of cover in the valleys of the creek. Recent work on the California, lying between the Silver King and the Toughnut, has revealed what is probably the west extension of one of the parallel veins which have been opened near the Silver King claim. The vein is 8-10 feet wide.

KOOTANIE BONANZA COMPANY.—Since R. D. Atkins obtained the practical control of this property, endeavors have been made to surround the doings of the company with an unaccountable air of mystery. Only the owners and miners are allowed upon the ground and all information is withheld. It is stated that President Van Horne, of the Canadian Pacific Railway, among others, expressed a desire to see the mines, but his request was not acceded to. Specimens of the ore—hundreds of tons are lying on the dump—for the Toronto exhibition were also refused. This mode of procedure is resented in the camp, for it gives outside investors the impression that the best known and most-promising mine on Toad Mountain is in a bad way. The showing at the Silver King, however, is much better than it was 12 months ago.

TRAIL CREEK.—The development work in this new center of excitement is proceeding satisfactorily; new ledges have been located during the past week, and prospectors are coming in from Washington Territory and the mining camps of West Kootanie.

WEST KOOTANIE DIVISION.

A collection of minerals from this division of the province is being made for the exposition at Toronto. The collection will be added to from time to time, and will probably figure at the World's Fair.

Canadian goods, in bond, are being brought in *via* the Northern Pacific Railroad. This concession on the part of the United States is highly appreciated in this section of the country.

CANADA.

LAKE OF THE WOODS DISTRICT.

PORT ARTHUR, August 11, 1890.

Some very fine specimens of asbestos have been brought in lately from this district. The fibre is long and clear, and the discoverers claim to have found it in quantity. Explorers have been pushing westward through the country lying between the Aticokan iron district, and Rainy River; specimens of gold-bearing quartz of very promising appearance and giving good assays have been brought in during the past week from that region, taken from 23 veins recently discovered. The country between the points mentioned is practically unknown.

This is the district through which the Ontario and Rainy River railroad is designed to run, and which the Ontario and Dominion governments are to be asked to subsidize at the coming session of Parliament. It will have its eastern terminus at Port Arthur, and will run through the silver and iron districts between Port Arthur and Hunter's Island, the Shebandowan and Moss township gold fields, the Aticokan iron deposits, and the timber, agricultural and mineral districts in the Rainy River country.

CROWN POINT.—One half interest in this property has been sold to Duluth capitalists for $100,000. The property is situated in the township of Lybster, and on location R 95, and comprises 160 acres. It adjoins the Shuniah-Weachu and West End Mining Company's ground on Silver Mountain. The location is traversed by three good veins. No. 1, or the main vein, outcrops for three-quarters of a mile; it has an east and west strike, and dips southerly about 15 degrees; its average width is 4½ feet. The gangue is calcspar, fluorspar, zincblende and a small quantity of galena. It carries native silver and argentite, giving good assays wherever opened, ranging from 25 ounces to 2,980 ounces to the ton. No. 1 is a true fissure vein, the country rock being faulted 9 feet throughout its exposure. No. 2 and 3 veins outcrop on the top of the mountain, and extend down over the east and west faces respectively. They have the same general strike and dip as No. 1, and carry silver in considerable quantities wherever opened.

No. 1 adit level, on No. 1 vein, was started in at a point 90 feet from the top of the mountain and has been driven 150 feet. No. 2 adit, on No. 1 vein, was started in 65 feet below No. 1 adit and carried in 528 feet on the vein at a point 400 feet in. In No. 2 adit a winze has been sunk 44 feet; 140 feet in on No. 1 adit a winze has been sunk to connect with No. 2 adit; another winze has been started near the breast of No. 1 adit and is now down 20 feet. There are five cross-cuts from 16 to 20 feet in length. On the westerly end of the outcrop, three-quarters of a mile from the workings described above, an adit has been run in on the vein 60 feet. These workings are all below the overlying trap and in the black argillaceous slates. The vein has been left standing in the last hundred feet of No. 2 adit, and a conservative estimate of the amount of ore

in sight at this point places it at 75 tons of smelting ore that will average about 400 ounces to the ton. The company has 1,400 tons of good milling ore on the stock pile that will average 50 ounces to the ton. During 1889 several shipments were made to Denver smelters, some of which gave an average value of 852 ounces to the ton.

The new company proposes to push development work with all possible speed. It will build a branch railway, in connection with the Shuniah-Weachu Mines Company, to connect with the Port Arthur, Duluth & Western railway, a distance of one mile. The company proposes to erect a 15-stamp concentrating plant, with power sufficient to run 25 stamps. Power drills and a compressed air plant will be placed in position as early as possible. It is also intended to start another adit 75 feet below No. 2, which is designed to be the main working level of the mine. It will give them about 230 feet of back ground. Very little hoisting or pumping is required. The force of miners will be increased as fast as men can be secured.

GREECE.

The island of Paros, in the Grecian Archipelago, whence was taken in ancient times the famous Parian marble, is about eleven miles long and eight miles wide at its widest part. There is a broad belt of nearly level land around the coast, but the interior is mountainous, rising to a height of 2,530 feet at Mount St. Elias.

The northern and western parts of the island consist of gneisses and schists, granite appearing also in the environs of Parekhia, or Parechia, as it is usually spelled, the capital town of the island. The southern part of the island consists chiefly of crystalline limestones. The finest statuary marble, or *lychnitis*, occurs in beds of from five to fifteen feet in thickness in these limestones at the quarries of St. Minas, where it is interbedded with a coarse grained white marble with bluish-black veins.

The coarse marble becomes darker in color near the lychnitis layer, both above and below it, and thus the layer of statuary marble is distinctly marked off. The dark color of this stone is said to be due to traces of binoxide of manganese and magnetic oxide of iron. This, if true, is quite at variance with most dark marbles, which owe their color to carbonaceous matter. It is thought probable that in the processes of metamorphism the impurities were withdrawn from the lychnitis layer and concentrated near the edges of the adjacent seams of limestone. No certain age is ascribed to these marbles. Those of Attica and Cyclades, to the westward, are considered as cretaceous; they are therefore much more recent than any of the American marbles now quarried.

The rocks are represented as much disturbed and folded, and often dip at right angles. The ancients in quarrying avoided the marble lying near the axis of elevation, as being of poorer quality than that in the other parts. A Greek company formed a few years ago to work the stone attacked it here, as it could be worked at less expense. This discredited the marble in the market, and the company failed as a consequence, after having expended some $800,000 in a railway, landing pier and elaborate installation of various kinds.

It is further stated that there is a good deal of excellent colored marble on the island that has never been utilized.

MEXICO.

It has long been a subject of speculation among mining men as to whence came the enormous quantities of gold found in the possession of the Aztecs by Cortés on his arrival in Mexico, no placer mines such as exist in California and Australia having ever been found here. It appears that the Aztecs did not smelt their gold ores, and that they had no means of separating the the precious metals, or of treating refractory ores. It follows that veins carrying a considerable ley in free gold were the only ones from which gold could be procured. A discovery, bearing not only on this theory but on the immense antiquity of gold mining as a Mexican industry, has lately been made in the State of Chiapas.

For a long time the superintendent of the great Santa Fe copper mine was satisfied that the mine was absolutely virgin, since none of the immense masses of copper ore, cropping out in all directions, showed the slightest trace of having been touched. True, there was one shallow hole near by, which, however, might easily have been sunk by some wandering prospector during the last few years. Lately, however, it was found necessary to grade out a hillside some 200 yards from the mine. The hill was densely wooded, but, after felling the timber and excavating two feet of black vegetable mold, traces of ancient workings were discovered, resulting in over 50 meters of an ancient dump being unearthed. This dump was found to contain blocks of rich, gold-bearing copper ore, thrown away as useless. The shaft of an old mine was also found. The whole workings appear to be entirely separate from the Santa Fe mine and in a lower formation.

On the Victoria mine, half a mile southwest of the Santa Fe also, there was no trace of any human being having worked on the mountain, not a dump, not a log, stump, and the ground covered with immense forest trees. A tunnel, driven to cross-cut the ore body had gone through over 70 feet of ore, when the present working was blasted. There is in the neighborhood no trace of humau habitation beyond an occasional idol found in the caves or hollows in the Santa Fe mine. Only three small, broken grinding stones were found.

There is a tradition still existing in Oaxaca and other gold-producing districts that each grown man in the times of Montezuma was obliged to pay a yearly tax of one quill of gold, and it may be that Chiapas which, till a short time ago, was hardly to be considered a mining state, was, in fact, one of the districts, carefully hidden from the Spaniards, from which the Mexican Emperor gathered a part of his vast treasures.

SONORA.

(From our Special Correspondent.)

We learn from Mr. A. K. Owen that Mr. Charles E. Herbert, an accomplished engineer and author of the latest official map of the Mexican State of Sonora, has found a practicable railroad route across the great Sierra Madres range from the Pacific shore to the plateau of Mexico. Mr. Herbert was assisted in his investigations by the engineer who traced out the tortuous route of the Denver & Rio Grande from Pueblo, Colo., to Provo, Utah.

Following up the Fuerte River, which empties into the Gulf of California at or near Topolobampo Bay, these engineers found a grade to the plateau on the eastern side of the summit of only three per cent. as the extreme—or about 150 feet to the mile. Usually the grade is light, the figures given being the extreme in the ascent of the unavoidable mountains. In the vicinity of Batopilas two surveys were run—one within ten miles of "Boss" Shepherd's great mine, involving a heavy grade and a long tunnel, and the other thirty miles away and without tunnel.

However, it will require sixteen tunnels to reach the plateau on the eastern side of the summit, most of them short and comparatively inexpensive. But the road will be built. It will be the most northerly road south of the Southern Pacific in the United States that can possibly cross that range of mountains.

Few Americans who have not explored that modern continental divide can conceive of the extent and ruggedness of the Sierra Madre. The eastern plateau runs up, like the slope of the Rocky Mountains, almost imperceptibly to the summit; but on the west the slope extends for 200 miles or more—once a gently sloping plateau of feebly coherent or but partially lithified mineral matter that in the ages has become deeply eroded by the precipitation of rain caused by condensation of moisture from the Pacific Ocean coming in contact with the (always) cold atmosphere of the mountains. While there are no great granite dikes or culminant peaks or ridges in the Sierra Madre, as in the Sierra Nevada or Wasatch ranges, it is, as a whole, infinitely more rugged and impassable; being for nearly 400 miles north and south by 200 miles east and west a confused mass of mountains of erosion, checkered in every direction by deep cañons and gorges from a few hundred to many thousands of feet in depth. And in this region of soft rock it is not uncommon for five inches of water to fall within eight minutes. Further south, in the vicinity of the Rio Fuerte and its tributaries, the country rock is more indurated and less subject to erosion. Here the inter-gulf railroad will be built, for north of that region it could not be maintained for a single season—if it could be built. But once across the mother range, this Pacific railway will seek the shortest and most feasible route to the trade centers of the United States.

N. B.—The survey by Engineer H. R. Holbrook, made by Mr. A. K. Owen's direction, in 1883, was the first and most extensive and careful which has ever been made of Southwestern Chihuahua. His report shows the maximum grade on the eastern slope to be 60 feet per mile and on the western slope the grade to be easy, excepting about 7 miles, in which there would be a 4 per cent. grade. There is not a tunnel required, and the average cost across the Sierra Madre by Engineer Holbrook's line would be but $30,000 per mile for railroad and equipment.

Since Engineer Holbrook's survey Mr. Owen has had the route examined with the view to avoid the said section of 4 per cent. grades, and there has been found an easy passage around the said section, with grades not to exceed 150 feet to the mile, and the entire route will be without tunnels from the Gulf of California to the Gulf of Mexico.

SALT.

The Carmen Island salt deposits are the finest and most extensive in the world.

Carmen Island is in the Gulf of California, 120 miles from Guaymas. The main salt deposit or pond is about three miles long and two miles wide, and the supply is said by those who have visited the island to be inexhaustible. The salt is so pure—much of it being clear crystal salt—that it only needs to be ground up to be ready for table use, the greater portion being 98 per cent. pure salt.

Mr. J. A. Nangle visited the island a short time ago to examine this wonderful deposit, and he says there is no denying the fact that the supply is practically inexhaustible. It has only to be broken and gathered up, when it is ready for shipment, and it is the intention of the owner, Mr. James Viosca, of La Paz, Lower California, to prepare for getting out 10,000 tons a month if there is a demand for that amount. There certainly will be, and now is, a big demand for it, as it is used by smelting men throughout Mexico, as well as in several States and territories in the United States, even in Alaska.

Mr. Viosca will begin work at once on a new wharf and in building a railroad from the wharf to the ponds, a distance of about 2,500 feet. That he will make these improvements complete is evidenced by the fact that he expects to spend $30,000 in gold in making them.

When everything on the island is in readiness for extensive work the railroad company will arrange for the prompt receipt at Guaymas of the salt and immediate shipment to all points, both in Mexico and the United States.

Even now large quantities of Carmen Island salt is shipped to Europe, and it is pronounced the finest natural salt in the world.

N. B.—Carmen Island is 109 miles northwest of Topolobampo. Many thousands of mules are now employed in taking a dirty class of lagoon salt from the coast near Topolobampo to mining camps directly east.

NOVA SCOTIA.

(From our Special Correspondent.)

COAL.—The strike at Springhill still continues unsettled, and has now reached its seventh week. Offers of outside arbitration have not been accepted, and both sides appear bound to fight it out.

The Joggins colliery is benefiting by the strike, as its sales have reached 300 tons a day, and the Saltsprings mine has also started to sell coal. At this point another seam three feet thick has been found, of excellent quality.

The discovery of a five feet bed of anthracite coal is reported from Mabon, Cape Breton. Mr. Greener, of North Sydney, reports that he has discovered the Mullins eight feet seam on the north side of Sydney harbor; should the seam on this side prove equal in quality to its exposure on the south side, it must underlie many square miles of territory. At several points in Cape Breton there is a scarcity of coal cutters.

GOLD.—On Friday last the engine house of the Empress mine, at Renpeer, took fire and was destroyed. Much damage was done to the hoisting engine, boiler, compressors, etc. An explosion of 15 pounds of dynamite added to the destruction. The property was owned by Charles North, of Summerville, Mass.

Arrangements are in progress for the transfer to an English syndicate of the best mines and properties at Malaga, Queens County. The sum of $400,000 is named as the price.

Experiments are being made at Mine Harbor with low grade slate belts with a view to putting up a mill. A shaft on the middle head, 130 feet deep, is expected shortly to cut rich ore. At Tangier it is reported that the Essex Company will put up a small chlorination plant.

From fossils found by Mr. Willis, of the Rawdon mines, it appears probable that the veins of that locality, which are fissure veins, are in the strata of the lower Silurian age. The Thompson mill, South Uniacke, has just returned 160 ounces from eight tons of quartz. Other mines are working steadily, but troubled by want of water.

SYRIA.

A discovery of petroleum has recently been made in the Alexandretta district in the vilayet or province of Alleppo. The United States consular agent at Alexandretta states that the land in which a certain kind of brownish soil emitting a peculiar and strong smell has been found extends about 14 or 15 miles to the west of Alexandretta, and from 1½ to 2½ miles inland from the sea shore, and that the district within which are the petroleum wells just discovered is situated within this area, and is not more than 275 square feet in extent. Despite a strong smell of naphtha, a rag steeped in the almost liquid substance does not ignite. An imperial irade has been issued, granting a concession for the exploitation to Najaty Effendi for a concessionary period of seventy-five years.

FINANCIAL STATEMENTS.

The following statement shows the financial balances of the principal mining companies having offices in San Francisco, on August 1st and on July 1st, 1890:

CASH ON HAND.

	Aug. 1.	July 1.		Aug. 1	July 1.
Alpha.....	$11,009	$14,528	Gould & Curry....	$9,672	$14,539
Alta.....	8,027	12,229	Ind'p'dence	2,322	1,646
Andes.....	22,201	22,201	Kentuck...	2,006	3,417
Belcher	27,157	*	Lady W....	13,680	15,064
Belle Isle...	*	*	Locom'tive	1,215	1,689
Best & B...	8,822	14,475	Mexican...	15,117	18,993
Bulwer.....	6,048	6,981	Mono	6,307	7,690
Bullion.....	11,878	15,462	Ophir.....	23,505	28,915
Bodie C....	30,844	8,035	Overman...	58,618	44,582
Caledonia..	5,893	6,031	Peerless ...	1,043	2,788
Chollar	3,243	16,658	Potosi.....	3,863	14,303
Confidence.	2,110	8,334	Sierra Nev.	37,366	42,683
Con. Cal. & Va	‡223,030	†189,746	Standard...	13,557	*
Con. N. Y..	10,640	12,342	Utah C.....	856	6,692
Exchequer.	632	3,614	Weldon	*	92

* Indebtedness.

† Includes $129,590 for unsold bullion with another shipment expected.

‡ Includes 211,590 of unsold bullion, with further shipments to be made, the monthly expenses of the mine not being paid as yet.

MEETINGS.

Spanish R. Mining Company, at the office of Henry Frawley, Deadwood, South Dak., August 19th, at 2 P. M.

DIVIDENDS.

Homestake Mining Company, dividend No. 145, of 10 cents per share ($12,500), payable August 25th at the office of Lounsbery & Co., Mills Building, New York City. Transfer books close August 20th and reopen August 26th.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
Alliance, Utah.....		July 7	Aug 12	Sept. 1	.10
Barnes Sulphur, Utah.....		July 17	Aug. 25	Sept. 13	.02
Belcher, Nev....	40	June 27	July 31	Aug. 21	.50
Bodie, Cal.....	12	June 16	July 22	Aug. 22	.25
Bona Fors, Cal.....	1	June 19	Aug. 11	Sept. 5	.05
Con. Imperial, Nev.	28	July 17	Aug. 20	Sept. 11	.05
Con. Pacific.....	12	June 21	July 23	Aug. 20	.10
Exchequer, Nev.....	29	July 10	Aug. 14	Sept. 4	.25
Golden Prize, Nev.	4	June 19	July 30	Aug. 18	.25
Teirakoff, Cal	4	June 9	July 26	Aug. 23	.01
Union Con., Nev...	41	July 21	Aug. 26	Sept. 15	.25

MINING STOCKS.

For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Minneapolis, St. Louis. Pittsburg, Birmingham, Ala.; London and Paris, see pages 209 and 210

NEW YORK, Friday Evening, Aug. 15.

The week under review shows some improvement over last week. The market was dull, but a more hopeful feeling prevailed among dealers, in pleasing contrast to the lassitude and apathy reported in our preceding issue. There has been a dearth of items of interest, but this is too frequent an occurrence to excite any comment.

Brokers, in unanimously declaring their intention to do the best in their power to have an active market soon, are doing what we have advised for a long time. There seldom is much activity during midsummer. With the return of cooler weather people will be flocking back to the city and more opportunities will be given to the dealers in mining stocks to increase their business, always provided, of course, that it is conducted in an honest manner.

The copper stocks continue to be dealt in. Of Atlantic 100 shares at $23.75 were sold. Calumet & Hecla was quiet at $306.13 to $306.25. This company has declared a dividend of $5 per share. Franklin was dealt in at $24.50; Osceola at $42 88; Quincy at $126.32; Tamarack, $208.75, and Huron at $7.25.

Of the Montana stocks Alice was in demand at $2.50@$2.55. Boston & Montana returns to the Exchange, and was moderately traded in this week at $60.13.

We note sales of the Black Hills stocks. Caledonia sold at $1.90, a decline of 10c. from last week. Sullivan Consolidated was steady at $1. Deadwood Terra was not dealt in.

Horn Silver was rather quiet at $3.45 to $3.50. Ontario was stationary at $45.25. Stormont was moderately traded in at 5c.

We note sales of the Colorado stocks. Adams at $1.45; Chrysolite at 25c.; Freeland at 40@43c.; Leadville Consolidated at 12c., and Small Hopes at 90c.

Of the Comstocks, Consolidated California & Virginia was lower, and closed at $3.50. Crown Point was sold at $2.60; Gould & Curry fluctuated somewhat starting at $2.85 and declined to $1.85 but rallied at the close and was sold at $2.10' Ophir declined during the week and closed at. $4.75; Savage had a solitary at $3.55; Sierra Nevada was quiet at $2.85@$3, as was also Yellow Jacket at $3.15@$3.30. Alta shows sales aggregating 1,000 shares at $1.10@$1.15. Best & Belcher was dull at $3.15@$3.20. Only one sale of Bullion, at $3.50, is reported. Chollar advanced from $2.70 to $3.60. Julia declined from 40c. to 35c., and shows sales of 1,500 shares. Mexican was stationary at $3.20. Occidental was traded in to the extent of 3,500 shares at from 75c. to 95c. Potosi was neglected at $5.88 to $6. Scorpion shows one sale at 35c. and Andes one at 90c. Utah was moderately traded in at 65c. to 80c.

Of the California shares, Astoria at 4c. was traded in to the extent of 1,500 shares. Mono was stationary at 50c. Plymouth has declined steadily during the past few weeks, and at the close was sold at $5. Reference to the company's finances and property will be found in our mining news column. Quicksilver preferred shows two sales at $41@$41.50. Sutter Creek was rather quiet at $1.05.

Sales aggregating 5,300 shares at from 6c. to 8c. are reported of the Brunswick Consolidated Gold Mining Company. There is evidently a determined effort to boom this stock. Standard advanced to 70c.

El Cristo shows transactions aggregating 1,600 shares at 60c. to 75c. San Sebastian was quiet at 38 to 40c. Rappahannock at 7c. was traded in to the extent of 4,000 shares. Mutual Smelting and Mining Company was steady at $1.55 to $1.60.

Phœnix shows the largest transactions of any one stock, 7,600 shares at from $1.10 to $1.25 having been disposed of.

Boston. Aug. 14.

(From our Special Correspondent.)

We have had a fairly active market for copper stocks this week, with a marked improvement in prices from the extreme depression of last week. There has been good buying with considerable apparent manipulation which seems to be for the purpose of acquiring a line of stocks at present low prices for profits later on. It is stated that there is also quite a large short interest yet uncovered which may produce renewed activity and advance the market. At all events the prospect for a good market this fall is encouraging and we confidently look to see our predictions verified in this regard.

The dealings in Allouez have been quite large and efforts have been made, partially successful, to depress the price, but it shows wonderful vitality and soon recovers. All the advices from the mine are favorable, and there is an evident purpose on the part of operators to accumulate stock. Last week it sold down to $7½, and this week advanced to $9¾. A raid was made on it yesterday, forcing it down to $8, but it rallied quickly, and to-day is strong at $8¾@$9. Arnold, which has been very quiet of late at $1½, sold up to $1.85 to-day. Latest advices from the mine represent the prospecting work as showing bunches of stamp copper.

Atlantic advanced from $20 to $24 on comparatively small sales, losing only $1 of the advance yesterday.

Boston & Montana, which was forced down to $55½ last week, rallied sharply to $59½ on covering of shorts and buying for long account. There was a slight reaction from the highest price for the week, selling to-day at $58.

Butte & Boston also advanced from $18 to $21.

The course of the market on both of these stocks has verified our predictions of last week.

Calumet & Hecla touched $298, which was one dollar lower than last week. The announcement of a $5 dividend advanced the price to $3.07. To-day it sold at $2.95 ex-dividend.

Franklin sold up to 25¼, which is a gain of $2½ over lowest price of last week, part of which was, however, lost, latest sales being at $24¼.

Centennial & Kearsarge have both been fairly strong throughout the week, the former advancing from $28 to $32½, closing at $31, and the latter from $18½ to $22½, closing at $20.

Advices from both of these mines indicate that the development work is progressing favorably.

Osceola sold up to $43 for a small lot, a gain of $4, but the later sales were down to $42. The stock is selling ex-dividend.

Quincy has been very quiet, with small sales, at $123.

Tamarack advanced from $205 to $209, but lost the advance on later sales. The product for July was 667 tons, the largest ever produced in one month.

Tecumseh sold at $4.

Huron advanced from $6⅞ to $7½, with later sale at $7.

National advanced to $2, and is in demand at $2 bid.

Santa Fe sold at 6½c., but there is very little doing in it.

In the speculative list of low-priced stocks there is nothing doing at present; 3 P. M. market closed firm.

Allouez, $8¾ bid, $9 asked; B. & M. C., $59 bid, $59¼ asked; C. & H., $295 bid, $298 asked; Cent., $30½ bid; Franklin, $24¼ bid, $25 asked; Kearsage, $18½ bid, $20 asked; Osceola, $41½ bid, $42½ asked; Quincy, $125 bid; Tamarack, $205 bid, $208 asked.

By Telegraph.—Calumet and Hecla, $300, Tamarack, $205 bid; Quincy, $125 bid; Boston and Montana $59¼, Osceola, $42½, Centennial, $30½ bid; Kearsarge, $19 bid; Allouez $9½.

Salt Lake City. July 28.

Company.	Opening.	Highest.	Lowest.	Closing.	Sales.
Alice, Mont.....	2 60 b	2 60 b	2.60 b	2.60 b	.....
Anchor, Utah.....	.....	.....	.....	.....	.....
Alliance, Utah....	2.00 a	2.00 a	2.00 a	2.00 a	.....
Apex, Utah.....	.18 b	.19 b	.18 b	.19 b	4,350
Barnes, Utah	.12½ b	.17 a	.12½ b	.12½ b	.....
Crescent, Utah....	.33 a	.33 a	.32 a	32 a	.....
Cent.-Eureka, Ut.	22.00 b	22.50 b	22.00 b	22.50 b	.....
Congo.....	.12½ b	.12½ b	.12½ b	.12½ b	1,000
Daly, Utah.....	22.00 b	22.00 b	22.00 b	22.00 b	.....
Glencoe, Utah....	3.00 a	3.00 a	1.50 a	1.50 a	.....
Horn Silver, Utah	.....	.....	.....	.....	.....
King of West, Id.	.....	.....	.....	.....	.....
Mammoth, Utah..	3.75 b	4.50 a	3.75 b	3.75 b	.....
Malad Con., Id...	.12¼ a	.12½ a	.10 a	.10 a	.....
Northern Spy....	.....	.....	.....	.....	.....
Ontario, Utah....	.....	.....	.....	.....	.....
Stanley.....	.....	.....	.....	.....	.....
Utah L. & C. Co.	8.00 b	8.20 b	8.00 b	8.20 b	.....
Utah Oil Co., Utah	.34 b	.34b	.34 b	.34 b	1,000
Woodside, Utah..	.....	.....	.....	.....	.....
Total.....					6,350

* Buyer 30 days. † Seller, 30 days. ‡ Assessment paid. a Asked, b Bid.

Denver. Aug. 11.

[From our Special Correspondent.]

The market still remains quiet as the hot weather continues. Prices remain about the same.

It has not been possible to get a quorum of brokers together of any committee except the listing one, who took action upon one applicant only. The placing of the building bonds, the return of President Taylor and the rest of the brokers, with cooler weather will, added to the encouragement now being received from Eastern sources, have a beneficial effect.

The eight dollar rate for ores under $50.00 to principal smelting points given by the Denver & Rio Grande Railroad lately, has already commenced to do good, and gross tonnage will be increased from almost every section. A five and six dollar rate would have added thousands of tons to their hauling.

Prices and sales during the week ending August 9th, 1890:

Company.	Opening.	H.	L.	Closing.	S.
Alleghany, Colo.....	15	*15½	12¼	12¼b	2,000
Amity, Colo.....	05½b	06	04½	04½b	3,800
Bangkok, C. B., Colo....	10¼b	12¼	10¼	12¼b	6,000
Bates-Hunter, Colo	45a	45	43	44b	8,800
Brownlow, Colo.....	10b	11	09	09b	600
Calliope, Colo.....	37b	38	36½	37½b	2,100
Cash.....	16b	16b	15	13b	300
Clay County, Colo.....	39	*40	37½	37¼b	4,500
Hard Money, Colo.....	04b	04½b	04b	04½b	.....
Little Rule, Colo.....	57b	58	54	53b	900
Matchless, Colo.....	.....	200b	150b	200b	.....
May-Mazeppa, Colo.. ...	72b	72	*68	64b	4,600
Mollie Gibson, Colo.. . .	49a	50a	25b	25b	.....
Oro, Colo.....	430b	445b	435b	51b	100
Pay Rock, Colo.....	06¼	06¼	06	06¼b	5,200
Puzzler, Colo	15	15	13	13½b	3,100
Reed-National, Colo....	67b	69	68	66b	600
Running Lode.....	18½b	18½b	15b	18b	.....
Silver Cord, Colo.....	35a	20b	20b	20b	.....
Whale, Colo	24	24	24	22½b	200
Prospects:					
Argonaut, Colo.....	24½b	24¾	24	24b	2,600
Aspen United, Colo.....	05b	05	05	05b	1,700
Big Indian, Colo.....	09¾b	09½	07	06¾b	4,800
Big Six, Colo.....	07½b	07½b	05¼	05½b	17,500
Claudia J., Colo	07½	08½	06¾	80¼b	10,100
Nat. G. & Oil Co...	24b	25½	19	18b	800
Diamond B., Colo.....	05¼	05½	04¾	05b	15.8 0
Emmons, Colo.....	23b	*28	24	24b	7,000
Golden Treasure, Colo..	15b	15b	14	14b	700
Ironclad, Colo.....	22½b	*24½	20	20½b	3,100
John Jay, Colo	13½	*15	13½	14b	3,7 0
Justice.....	13b	15	15	10b	100
Legal Tender, Colo.....	04¾b	04¾	04¾	04½b	1,700
Morning Glim, Colo.....	50a	48b	45b	45b	.....
Park Consolidated.....	20½b	20½	20½	20¼b	2,200
Potosi, Colo.....	10½b	10½	08	09¼b	9,400
Rialto. Colo.....	50	50	50	40b	100
Total for the week.....					124,100

*Buyer 30 days †Buyer 60 days. ‡Seller 60 days. a Asked. b Bid.

Kansas City. Aug. 12.

Company.	Opening.	H.	L.	Closing.	Sales.
Argonaut.....	25½*	25½*	25½*	25½*	100
Bates-Hunter.....	43½	45*	43½	43½	6,900
Big Six...	7*	8¾‖	6¾*	8‖	3,000
Brownlow.....	....	....	....	....	.....
Cash Gold.....	22	21*	20½‡	20½‡	5 000
Clay County.....	37½	41‖	33	41‖	2,300
Diamond B.....	5	5½*	5	5½*	700
Hard Money.....	4†	4¾	4¼	4¼	400
Hunki Dori.....	8†	15‖	8†	15‖	100
Iron Clad.....	22½*	23*	20½	20¼	5,100
Kansas City M. & M. Co.....	2.70‡	2.70*	2 60	2 62½	360
King Jack..... ..	80‡	....	....	....	... ..
Little Nugget.....	56	56	56	56	500
Little Rule.....	53½‡	....	....	..	.....
May Mazeppa.....	63‡	....	....	....	.....
Minnequa Zinc M. Co..... ..	20½	23½*	20½	21½	4,800
Monte Cristo.	7†	11½‖	7½	7½	2,900
Morning Glim.....	48	48	48	48	400
Pay Rock.....	6½	6½	6½	6½	100
Pelican.....	22½	23	22	22	6,200
Potosi	10†	20‡	....	....	.....
Running Lode.....	20	20	20	20	200
Sylph	18*	18*	18*	18*	500
Total.....					39,560
Pit sales.....					.....

†Bid. ‡Asked. * Buyer 30. § Seller 30. §* Seller 60 ‖ Buyer 60.

Minneapolis. August 12.

Company.	Bid.	Asked.
Algoma.....	.30	$1.00
Aurora I. M. Co.....	7.50	....
Badger Silver Mg. Co.....	5.00	10.00
Black Hills Tin M. Co.....	....	1.50
Canada G. Mg. Co.....	.20	.50
Carbonate Hill Mg. Co.....	.50	1.00
Clingstone I. Mg. Co.....	....	....
Crescent I, Mg. Co	1.00	....
Deer Lodge Mg. & Sm. Co.....	....	....
Derwood Con. Mg. & M. Co.....	....	....
Dot Iron Mg. Co.....	....	....
El Dorado I. Mg. Co.....	....	1.00
Fairview S. Mg. Co.....	....	.50
Glengary S. Mg. Co., Mont.....	....	....
Gogebic Iron Co.....	....	....
Iron Duke Mg. Co.....	1.00	1.50
Kakabeka Mg. Co.....	.25	1.00
Keystone Mg. Co.....	.30	1.00
La Belle I. Mg. Co,.....	1.00	1.50
Marquette Iron Synd.	....	3.50
Minnehaha M. Co ...	....	2.00
North Pabst I. Mg. Co.....	....	....
N. W. Coal Mg. Co.....	3.25	3.75
Stengle L. & M. Co	1.00	1.50
Thunder Bay G. & S. M. Co..	.75	1.00
White Spar Mica Mg. Co... .	1.15	2.00

St. Louis. Aug. 13.

(From our Special Correspondent.)

The mining trade here is very slack, but few stocks being traded in, and those at poor prices. With but few exceptions all the mining stocks have fallen somewhat. As usual a few stocks monopolize all the trading. Friday was the dullest day of the year.

No sales were made on call, and only one during the day. That trade was one of 4 000 of Tourtelotte stock at 4½c.@5c. This stock has had a boom lately, and 9,600 shares were sold during the week at prices ranging from 4½c.@6c. Central silver sold well during the week, while Pat Murphy managed to sell 2,500 shares; the price rose from 11c.@15c.

The Granite Mountain's weekly shipment amounted to 45 bars, containing 64,875 ounces of silver and 172 ounces of gold.

The Bi-metallic's last shipment was 22 bars, containing 26,141 ounces of silver and 23 ounces of gold.

Adams suffered a big drop of 32½c. during the week, closing at $1.05.

PRICES AND SALES FOR THE WEEK ENDING AUGUST 13, 1890.

Company.	Opening.	H.	L.	Closing.	Sales.
Adams	$1.37½	....	....	1.15	....
American & Nettie	1.75	1.80	1.72½	1.75	200
Bi metallic	32.00	....	....	32.50	....
Central Silver	.17½	.18¾	.15	.16¼	5,000
Cleveland, Colo.	.01½	...	....	.04	.....
Gold King	.03½	....	....	.03	.....
Granite Mountain	46.00	47.00	46.00	46.50	150
La Union	.08	.09½	07½	.09	200
Little Albert	.40	.43¾	.40	.42½	.....
Montrose Placer	.42½	....	....	.45	.....
Major Budd	.08	11	.07	.10	200
Mexican Improvement	.16¼	...	....	.15	.....
Mickey Breen	1.20	....	....	1.12½	900
Mountain Key	.55	.55	.46¼	.50	.....
Pat Murphy	.11	....	....	.15	2,500
Richmond Hill	.15	.20	....	.15	1,500
Silver Age	1.47½	1.50	1.45	1.45	500
Small Hopes	.92½	..	....	.81¼	.....
Tourtelotte	.05	.06	.04½	04½	9,6 0
West Granite	1.05	....	....	1.00	.....
Yuma	.56¼	....	....	.58¾	100
Total					20,850

Lake Superior Iron and Gold Stocks.

(Special Report by David M. Ford, Houghton, Mich.)

IRON MINING STOCKS.

Name of company.	Par value.	Bid.	Asked.
Ashland Iron Co	$25.00	$55.00	$58.00
Aurora Iron Co	25 00	8.00	8.50
Champion Iron Co	25 00	.	90.00
Chandler Iron Co	25.00	38.00	40.00
Chapin Iron Mining Co	25.00	30.00	33.00
Chicago & Minn. Ore Co	100.00	115 00	118 00
Cleveland Iron Co	25.00	18.00	18.50
Germania	25.00	11.50	12.00
Jackson Iron Co	25 00	110.00	....
Lake Superior Iron Co	25 00	70.00	75.00
Milwaukee Iron Co	25.00	5.50	6.50
Minnesota Iron Co	100.00	84.00	86.00
Montreal Iron Co	25.00	8.00	9.00
Norrie (Metropolitan)	25.00	75.00	68.00
Odanah Iron Co	25.00	*16.50	22 00
Pittsburg Lake Angeline Co	25.00	175.00	180.00
Republic Iron Co	25.00	42.50	43.50

GOLD MINING STOCKS.

Name of Company.	Par value.	Lowest.	High.
Gold Lake Min. Co	....	....	....
Grayling Gold & Silver Co	$25.00	....	....
Michigan Gold Co	25.00	$1.25	1.50
Peninsula Gold & Silver Co	25.00	.50	....
Ropes Gold & Silver Co	25.00	2.25	2.50

* Actual sales were made at this price.

PIPE LINE CERTIFICATES.

(Specially reported by Messrs. Watson & Gibson.)

Pennsylvania oil has been active this week at better prices, and there is little disposition to buy it, on the theory that it will sell lower as soon as Ohio oil is listed, which will be next week. It is expected that the petroleum market next week will be active, and that considerable dealings will take place in Ohio oil at advanced prices.

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Aug. 9	92	92½	91⅞	92	72,000
11	91¾	92	91¼	92	35,000
12	90⅝	91	90	90	42,000
13	90	90	90	90	17,000
14	91⅛	92⅛	91⅛	92	76,000
15	92½	93⅛	92	92	79,000
Total sales in barrels					321,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales
Aug. 9	92¾	93⅝	92⅝	92¾	67,000
11	92⅛	92⅝	92	92⅛	25,000
1	91⅞	92¾	91⅜	90⅝	73,000
13	90⅝	91⅝	90	91	125,000
14	91	93¾	91	93¾	141, 0
15	92½	93¾	92¼	92⅝	113,000
Total sales in barrels					544,000

COAL TRADE REVIEW.

Statistics.

New York, Friday Evening, August 15.

Mr. John H. Jones, chief of the Bureau of Anthracite Coal Statistics, furnishes us the following statement of shipments of anthracite coal (approximated) for the week ending August 9th, 1890, compared with the same period last year:

Regions.	Aug. 9, 1890.	Aug. 10, 1889.	Difference.	
Wyoming Region	Tons 420,349	412,463	Inc.	7,886
Lehigh Region	" 126,278	121,408	Inc.	4,870
Schuylkill Region	" 249,818	251,528	Dec.	1,710
Total	796,445	785,399	Inc.	11,046
Total for year to date	19,679,008	19,961,826	Dec.	282,818

STATEMENT of anthracite coal shipments for month of July, 1890, compared with same period last year, compiled from returns filed by the mine operators:

	July, 1890.	July, 1889.	Difference.	
Wyoming Region	Tons 1,758,124	2 001,763	Dec.	243,639
Lehigh Region	" 532,843	598,655	Dec.	65,811
Schuylkill Region	" 1,019,110	1,027,103	Dec.	7,993
Total	3,310,078	3,627,522	Dec.	317,443

	For year. 1890.	For Year 1889.	Difference.	
Wyoming Region	Tons 9,613,856	10,053,468	Dec.	439,611
Lehigh Region	" 3,463,459	3,440,040	Inc.	23,419
Schuylkill Region	" 5.598,716	5,281,215	Inc.	317,500
Total	18,676,031	18,774,724	Dec.	98,692

The stock of coal on hand at tide-water shipping points, July 31st, 1890, was 751,231 tons; on June 30th, 1890, 720,506 tons; increase, 30,725 tons.

PRODUCTION OF BITUMINOUS COAL for week ending August 9th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1890. Week.	1890. Year.	1889. Year.
Phila. & Erie R.R.	2,516	80,421	41,846
Cumberland, Md.	*83,750	2,237,333	1,827,750
Barclay, Pa	*2 975	90,217	69,965
Broad Top, Pa	6,742	310,237	191,294
Clearfield, Pa	64,747	2,319.684	1,831,552
Allegheny, Pa	24,809	803,907	460.187
Beach Creek, Pa	38,393	1,139,226	889,694
Pocahontas Flat Top	31,493	1,159,163	1,029,206
Kanawha, W. Va.	*34,672	1,229,474	1,045,430
Total	290,097	9,369,712	7,386,924

* Estimated.

WESTERN SHIPMENTS.

Pittsburgh, Pa	13,504	516,899	365,978
Westmoreland, Pa	9,865	775,597	833,414
Monongahela, Pa	12,279	286,202	224,753
Total	35,648	1,579,098	1,424,145
Grand Total	325,745	10,948,810	8,811,069

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending August 9th, and year from January 1st, in tons of 2,000 lbs.: Week, 88,222 tons; year, 3,239,824 tons; to corresponding date in 1889, 2,615,032.

Anthracite.

The sales agents held their regular meeting on Wednesday, 13th inst., but did nothing beyond placing the seal of confirmation on the proceedings of their previous meeting, when they decided upon the output for the month of August. There continues to be some uneasiness among them concerning the cutting of rates and overproduction, but nothing further has been done in this respect than announced in our report of their meeting, unless it was a general agreement, aimed at the chief sinners, that the last circular "must be lived up to."

After all, the overproduction does not seem to be so great, as the official figures only show 30,725 tons on hand at tidewater shipping points over the amount for the corresponding period of last year, the respective figures being 751,231 tons for 1890, and 720,506 tons for 1889. The total production for the year, however, is 282,813 tons less than it was at the same period in 1889. In the light of these figures there is a decided opinion that a substantial increase in the circular prices will be decided upon at the next meeting, as they are lower this year than in 1888 or 1889, as will be seen:

	July, 1888.	July, 1889.	July, 1890.
Broken	$3.75	$3.90	$3.65
Chestnut	4.25	4.15	3 65
Stove	4.25	4.40	4.00
Egg	4.00	4.15	3.75

The expected August boom has not materalized yet, and the market could scarcely be duller than it is.

The amount of coal on hand, and still coming in from the mines, keeps pea and buckwheat coal very weak. Clear, free-burning pea is quoted at $2.50 f.o.b., with lower grades anywhere below 30 cents less; buckwheat, $1.70.

Bituminous.

Plenty of soft coal is moving forward on contracts, but new transactions are scarce just now. The market continues fairly firm, with consumption evidently increasing.

The labor troubles in Wales, which closed most of the coal mines for a few days, had a decided effect on the New York market. The cables were busy between European, Central and South American consuming points and New York, and operators were preparing to agree to ship coal in place of the Cardiff coal. But the lively expectation was nipped in the bud by the news, received yesterday morning, that the rick was over, and the miners and railroad people working again. One result of the strike, however, is a demonstration that American soft coal operators are ready to supply the Mediterranean and South American consumers, and at a price which is not much higher than the Cardiff prices. "If the steamship Subsidy bill should pass," said a large operator, "we could send out our soft coal in competition with the Cardiff coal. It is a better coal, but freights and the lack of shipping facilities discriminate against it."

Freights are about 5 cents weaker all round than they were last week, and ships are so plentiful that the tables are turned, and captains are now looking for coal instead of holding out for ice freights. Prices remain: Baltimore, $2.40@$2.50 f. o. b.; Philadelphia, $2.50@$2.60; in new York harbor, $3.25; alongside, $3.50.

Boston. Aug 14.

(From our Special Correspondent.)

The anthracite coal market, like all other branches of business here, has been seriously interfered with this week by the Grand Army encampment. Retail trade especially has been almost at a complete standstill. The prevalent opinion here is that prices are as low as they are likely to be this season and that freights will not continue as low as they now are very long. But the fact is that retail trade has been more backward this summer than usual and retailers must sell some coal before they can take any more. It is expected that there will be a better retail movement after this week.

F. o. b. prices continue weak and wholly in buyer's favor. The Philadelphia and Reading and Scranton companies have, perhaps, been rather firmer in their adherence to nominal prices than the other companies, but neither they nor any other company are doing any business worth mentioning. Individual coal is offering at $3.50 f. o. b. for broken and $3.50 for egg and stove. These are pretty close to bottom figures and company coal would command a little more. It is expected that at the meeting of the companies in New York today some energetic steps will be taken to enforce restriction.

The bituminous coal trade is notable only for the ease experienced by shippers in getting coal forward on their large contracts. A leading firm of coal shippers told me to-day that they never before had had their contract so well in hand on the matter of delivery at this stage of the season. There is very little transient trade. Prices remain unchanged for cargo lots.

Freights are as low as last week. The Baltimore rate has touched $1, which is very low, and soft coal shippers are feeling pretty good over the fact. The Philadelphia rate is 80@90 cents, and the New York rate 60@65 cents. An extra large barge could be had in New York for 55 cents probably. The weakness of freights is attributable to several causes. The lumber trade was very good last year, but is now poor, and has returned many vessels to the coal trade. Then the season has been remarkable for its quick trips, both by barges and sailing vessels, and finally some of the barge transportation companies which never before ran their barges out of Long Island Sound have been sending them to Boston this year.

Retail quotations are unchanged. Dealers look for a more active movement during the last half of August.

Buffalo. Aug. 14.

[From Our Special Correspondent.]

There are no special noteworthy features in the anthracite and bituminous coal trade. The strike on the Central Railroad limited the receipts of bituminous, but as its duration was so short no real hindrance was felt. Prices of coal unchanged; probably the anthracite schedule may be varied a little September 1st or 15th. The bituminous figures now depend more nearly on supply and demand than has heretofore been the case and the car demurrage charge has a tendency to keep the market steady.

The "Eiffel" coal elevator of Mr. Hefford is completed but the apparatus connected with it thus far has not worked successfully.

There is considerable talk among our Lake marine men on the breaking of the valve of the Sault Ste. Marie canal. From all accounts it appears that the pumping and other apparatus to meet such an emergency is deficient, and the repair to the broken valve is of the most temporary character. The Government officials at the Sault say that they have no money to buy or even hire apparatus with, which is doubtless true.

Lake freights on coal steady, with moderate movement. The shipments from this port from August 7th to 13th, both days inclusive, were 51,310 net tons, distributed as follows: 22,500 to Chicago, 5,620 to Milwaukee, 8,100 to Duluth, 2,650 to Superior, 3,810 to Toledo, 250 to St. Clair, 1,000 to Hancock, 100 to Gladstone, 1,340 to Detroit, 600 to Sheboygan, 360 to Houghton, 1,780 to Racine, 500 to Green Bay, 300 to Saginaw, 1,270 to Port Arthur, 130 to Bay City; total thus far this season, 934,390 net tons.

The rates of freight were: 60c. to Chicago and Racine; 55c. to Sheboygan; 50c. to Milwaukee, Portage, Green Bay, Houghton and Hancock; 40c. to Duluth, Superior, St. Clair and Mackinaw; 45c. to Port Arthur or Fort William and 30c. to Toledo, Detroit and Monguagon. Closing firm.

Canal movement, first week in August, of coal

from this port: Shipments, none; receipts, 1,056 net tons. No Eastern freights reported.

Chicago. Aug. 13.

(From our Special Correspondent.)

The coal trade in Chicago is dull. Dealers counted on a much larger demand than that developed up to date, and are consequently disappointed, but of course hope that prospects will materially improve within the next month. The only exception to the general prosperity which pervades all manufacturing and producing industries is to be found in the anthracite coal market, which it is said, was never so dull as at present—accounted for, by some, by over-production. Improvement is not looked for before September 1st.

The general character of the soft coal market is more satisfactory; a drawback is felt on account of scarcity of cars for transportation. railroad cars being required for fruit and other perishable freight to an extent that interferes very much with the movement of soft coal. At the Connellsville furnaces an improvement is noted in the demand for coke.

We continue to quote retail prices at: Large egg, $5.75; small egg, range and chestnut, $6.

On cars, f.o.b. Chicago: grate, $5; stove, range and chestnut, $5.25; Lehigh, lump, $7.

As the consuming public has but very little, if any, stocks on hand, when buying does begin it will be done with a rush. The latter part of this month will doubtless show some lively buying to save the advance which will undoubtedly be made September 1st.

The figures for bituminous remain firm and unchanged.

They are, per ton of 2,000 pounds: Green and Sullivan County (Ind.), shaft, $2.25@$2.40; Jackson Hill, $3.25; Hocking Valley, $3; Ohio Central, $3; Erie, Briar Hill, $4.15@$4.2; Indiana Block, $2.35; Youghiogheny, $3 35; Sunday Creek, $3.

Many orders are behind on account of the scarcity of cars referred to. It is expected that the tonnage handled here will far exceed even that of year before last, which was the heaviest on record.

Prices for coke remain also unchanged. Seventy-two-hour Connellsville, $5.20; crushed (domestic), $4@$4.25; Elk Lick, $4.25@$4.50.

Pittsburg. Aug. 14.

(From our Special Correspondent.)

Coal: There is very little to report; values in the pools are the same as have ruled for some time past. Boats and barges loaded in the pools estimated at 2,225,000 bushels, and about the same amount loaded at the landings about Pittsburg. This coal can not be moved until we have a rise in the Ohio. Reports from the lower market are more favorable for holders, prices steadily advancing.

Nominal rates in pools:

	Per 100 bushels.		Per 100 bushels.
1st pool	$4.75	3d pool	$3.90
2d pool	4.50	4th pool	3.25

Railroad coal, $5.00@$5.50.

Connellsville Coke.—The market rules firm with a fair trade demand. A number of furnaces has started up and others are preparing to do so; this will undoubtedly increase the demand. Prices show no change. Most of the plants are making full time, six days per week. Transportation is all that could be desired. The week's shipments reach 7,215 cars; West, 4,425; East, 1,440; Pittsburgh, 1,650; list of idle ovens, 2,350; active list, 12,600. A number of new ovens are nearing completion. On the whole the outlook is good.

The rates were for 2,000 pounds f.o.b. cars at ovens. Blast furnace coke, $2.15; foundry coke, $2.45; crushed coke, $2.65.

Freights to Pittsburg 70c. per ton, Mahoning and Shenango Valleys, $1.35; St. Louis, $3.30; Cleveland, $1.70; Chicago, $2.75.

FREIGHTS.

From Philadelphia to: Alexandria, .85; Baltimore, †.60; Bath, *.77½; E. Braintree, 1.00; Boston, Mass., .80@.90; Lynn, *1.05; Naponset, *.85; Newburyport, .75; New York, †.90; Norfolk, .70; Portland, *75; Richmond, *.85; Salem, *.75; Washington, †85.

*And discharging. †Alongside.

METAL MARKET.

NEW YORK, Friday Evening, Aug. 15.

Prices of silver per ounce troy.

Aug.	Sterling Exch'ge	Lond'n Pence.	N. Y. Cts.	Aug.	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
9	4.87	51⅜	1.12½	13	4.86½	51¼	1.12
11	4.87	51¾	1.13¼	14	4.87	51⅝	*
12	4.86½	51½	1.12¼	15	4.87½	52¼	†

* 1.12⅝ to 1.12¾. † 1.13¾ to 1.14.

The United States assay office at New York reports total receipts of silver for the week to be 140,000 ounces.

Coinage in the Fiscal Year 1890.

The Bureau of the Mint issues the following statement of the coinage executed at the mints of the United States during the fiscal year ending June 30th, 1890:

Denomination.	Pieces.	Value.
Double eagles	977,393	$19,547,860.00
Eagles	239,870	2,398,700.00
Half-eagles	7,599	37,995.00
Three dollars	2,374	7,122.00
Quarter-eagles	67	167 50
Dollars	29,904	29,904.00
Total gold	1,257,207	$22,021,748.50
Stan ard dollars	35,9..3,816	$35,923.816.00
Half dollars	12,716	6,358.00
Quar er dollars	12,716	3,179.00
Dimes	8,824,837	882,483.70
Total silver	44,774,085	$36,815,83 .70
Five cents	18,745,198	$937.259.00
Three cents	18,801	564.03
One cent	47,902,780	479,027.80
Total minor	66,666,779	$1,416,851.73
Total coinage	112,698,071	$60,253,436.93

Silver Bullion Certificates.

NEW YORK STOCK EXCHANGE.

	Price. H.	Price. L.	Sales.
Aug. 9	113	112¼	219,000
Aug. 11	113⅛	113	348,000
Aug. 12	112⅞	112⅛	143,000
Aug. 13	112⅝	112¼	135,000
Aug. 14	113¼	112⅛	324,000
Aug. 15	114⅞	114¼	1,016,000
Total sales			2,211,000

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday made no change in its rate for discount, and it remains at 5 per cent. During the week the bank gained £1,465,201 bullion, and the proportion of its reserve to its liabilities was raised from 36·64 to 41·93 per cent., against an advance from 36·18 to 37·17 per cent. in the same week of last year, when its rate for discount was 3 per cent. On the 14th inst. the bank gained £335,000 bullion on balance.

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked.
Trade dollars	$ .88	$ .88
Mexican dollars	.89	.89
Peruvian soles and Chilian pesos	.81	.80
English silver	4.86	4.90
Five francs	.94	.95
Victoria sovereigns	4.86	4.93
Twenty francs	3.86	3.90
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.80	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.60
Ten guilders	3.96	4.00
Bar silver	1.14⅛	1.13½

Copper.—A distinctly quieter tone has come over the market during the past week, and the lake companies are now all freely offering to book orders for August and September shipment at 17c., but below that figure nothing is offered. The deliveries of Lake copper to consumers are keeping pace with production, and there is certainly no pressure to sell. For Arizona copper previous quotations are also well sustained, but casting sorts are still comparatively depressed at about 14⅜@15c.

On the whole, there are no indications of diminished confidence in the future of the market, but for the time being there is an entire absence of speculative activity. In London the market for Chili bars and G. M. B. copper has been gradually hardening during the week, and to day's closing quotations received by cable, viz.: £58 5s.@£58 7s. 6d. spot, and £58 10s.@£58 12s. 6d. three months, mark a rise of about £12 6s. over last week's closing prices.

Of the large quantities of furnace material recently sold by the French banks to the English smelters it is understood that very little has yet been withdrawn from warehouse, but large deliveries are anticipated during the next month. In refined manufactured sorts we have to report no alterations in the quotations from last week.

The exports of copper during the past week were as follows:

To Liverpool.	Copper matte.	Lbs.	
By S. S. City of Chester	227 bbls.	224,574	$12,000
To Liverpool.	Copper.		
By S. S. City of Berlin	3 cases	....	$180
To Bordeaux.	Copper.	Lbs.	
By S. S. Panama	121 bars.	39,177	$4,309

Tin.—The tone of the market may be fairly described as quiet but firm. The consumptive demand continues fairly satisfactory, and in the absence of any pressure on the part of holders to sell prices have been well sustained. The dealings in the Metal Exchange have been so insignificant as hardly to be worth reporting. Recent arrivals have been comparatively light. Our closing quotations are: Spot, 21⅛; August, 21⅛; September, 21·20; October, 21·25.

In London the market has been rather dull during the week, and prices have gradually eased off a trifle, the latest quotations received by cable to-day being £93 15s. @ £93 17s. 6d. spot, and £94 5s. @ £94 7s. 6d. three months, or 10s. below the closing quotations of last week. It is anticipated that the total shipments from the Straits for the month of August will be light.

Lead,—Quite a change has come over the lead market. For a long time past we have, week by week, to give the monotonous report of a dull and lifeless market. It is now evident, however, that this condition of affairs was to a large extent the result of manipulation with the object of keeping prices down in order to buy heavily. To some degree these tactics have been successful, but only to a moderate extent, as generally speaking holders would not part with their metal at the lower quotations, and the small lots that did come into the market were quickly bought up and passed into stronger hands. During the last few days buyers having boldly entered the market prices immediately responded, and the smelters proving very reluctant sellers, quotations advanced to $4.60@$4.62½.

There cannot be the slightest doubt that during the last few months production has been seriously diminished, and for some time past it has been well known that the old warehouse stocks have been gradually dwindling down until they now assume insignificant proportions. At the same time the demand for consumption is a growing one.

The St. Louis Lead Market.—Messrs. John Wahl & Co. telegraph us as follows: "Since our last week's report a strong undercurrent has gradually developed which clearly demonstrates that consumers have been supplying themselves in a hand-to-mouth manner only so as to meet their requirements. To-day the market advanced in sympathy with European and seaboard advices, and sales were made of common and desilverized lead at 4·35 c.@ 4·37½c."

The Chicago Lead Market.—Messrs. Everett & Post telegraph us as follows: "The market has been active, steadily stiffening Prices opened at 4·35c., and under sales of some 500 tons advanced to 4·40 and 4·45c. The closing is very firm and the present outlook is for 4·50c. before many days."

Spelter.—The market is decidedly firmer, with spot metal very scarce. We have to advance quotations to 5 50 @ 5·55.

Antimony, without change at 23½ for Cookson's, at 21½ for L. X., and 20 @ 20¼ for Halletts

IRON MARKET REVIEW.

NEW YORK, Friday Evening, August 15.

The iron market is dull all through, with trifling variations in one or two branches. But while it is dull it is agitated, and agitated about nothing. Some weeks since we exclusively published the fact in this column that a number of English and Scotch capitalists were seeking the financial aid of a few American capitalists, and that, together, they intended to constitute a syndicate to corner warrants in Scotch pig iron. Since we published this news, which is now confirmed as correct, word has been received that a bill has been presented to the English parliament which makes it unlawful to issue warrants for pig iron that is not actually stored somewhere. Taking these two facts in conjunction, several contemporaries have devoted much space to ventilating their supposition, which they have presented in the shape of news for those concerned in the iron trade.

The mere statement, as we made it, is correct. The additions which have been made in half a dozen papers are exaggerations. Says one of the New York dailies:

A cable dispatch stated that Scotch warrants advanced yesterday because an American syndicate was buying. Representatives of iron interests in Glasgow have been here in New York for some little time trying to ferret out the truth of rumors current from time to time that American capitalists were disposed to invest heavily in Scotch iron warrants, and they appear to have sent dispatches confirming the reports to Glasgow and Birmingham. I hear that the report in question is true. It is stated that in June a strong London syndicate made overtures to Wall street parties to enlist them in a large venture in Scotch pig iron warrants in Glasgow. In fact, the idea was to purchase the whole stock there and also to operate in American pig iron.

Another paper comes out with the announcement that the market in American pig iron is to be gobbled up by the Scotch pig syndicate, and that pig iron, generally, is to be ballooned up.

The sole foundation for all this agitation is a six-line paragraph which appeared in our iron trade report of July 5th, stating that some American capitalists were about to join with some English capitalists to buy Scotch pig iron. There is absolutely nothing else in it. It will have scarcely a perceptible effect on this market, as the demand here for Scotch pig iron is relatively insignificant.

It is expected, all round the trade, that steel and iron in all their forms will, at an early day, begin to advance, but such hollow boomlets as those referred to will injure rather than advance legitimate trading.

American Pig Iron.—Nothing doing, and quotations are nominally as follows: Southern No. 1, $17.25@$18; No. 2, $16.50@$17; Northern, No. 1, $18@$18.50; No. 2, $17@$17.50.

Scotch Pig Iron.—Arrivals are as small as the demand. There is practically no market for Scotch pig iron just now, and quotations remain: No. 1 Coltness, $23.50; Dalmellington, $20.50; Eglinton, $19.25.

Spiegeleisen and Ferro-manganese.—The market for spiegeleisen and ferro-manganese is utterly lifeless, though there is a general expecta-

tion that activity will soon set in. Prices may be stated as $30.25@$31 for 20 per cent. spiegeleisen, and $73.75@$74.50 for 80 per cent. ferro-manganese.

Steel Rails.—The market remains in the same condition as last week—firm and dull. We hear of no orders, except a comparatively small one for the South at a trifle below the quoted price, $31, and this is not authenticated.

Rail Fastenings.—Little is doing and prices remain: Spikes, 2c.; angle plates, 1·75@1·80c.; bolts and square nuts, 2·70c.; hexagonal nuts, 2·95@3c.; complete joint, iron and steel, according to weight.

Tubes and Pipes.—Business is looking up. There is a rush to complete present contracts caused by expectation of a large order from a big concern, which, it is stated, is the Standard Oil Company, whose last contract of 280 miles of pipe is now well under way. Ruling discounts on car lots: 47½ per cent. on butt, black; 40 on galvanized; 60 on lap, black, and 47½ on lap, galvanized; 40 on 1¾-inch boilers; 50 for 2 to 4-inch, and 52½ on larger than 4-inch casing, all sizes, 50 per cent.

Merchant Steel.—Trade is now in a comatose state, with expectation of an early revival. Preparations are going on for a busy fall season. Prices remain: Best English tool steel, 15c. net; American tool steel, 7½@10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; open-hearth machinery, 2¾c.; open-hearth spring, 2¾c.; tire steel, 2¾c.; toe calks, 2¾c.; flat file, 4¾c.; mill file, 5¼c.; taper file, 7¼c.; first quality sheet, 10c.; second quality sheet, 8c.

Old Rails.—Last week's figures, $25 for tees and $26 for doubles, remain as mere nominal quotations. There are very few old rails in the market. Two parties, who hold nearly 4,000 tons, refuse to sell for less than $28 a ton. There is a continual demand from the west.

Structural Iron and Steel.—This is the busiest branch of the iron trade, though featureless. Prices have not varied now for some time, and are: Universal plates, 2·20@2·28c.; bridge plates, 2·15@2·20c.; angles, 2·10@2·15c.; tees, 2·65c.; beams, 3·10c. There is a general expectation, however, that as several large new buildings are to be estimated for shortly, that fact will counteract the effect of the winter stoppage of building operations, and a rise is not at all unlikely.

Chicago. Aug. 13.

(From our Special Correspondent).

Continued firmness exists in the Chicago iron market as to prices, and the various industrial plants located in and near this city are consuming large quantities of the crude material. Car shops and pipe works, as well as foundries, machine shops, stove founders and implement makers are well employed; rolling mills are busy, and in but a few instances founders are refusing new business, having already a full quota of orders, and are experiencing some difficulty in obtaining molders. Taking all things into consideration, trade in iron and steel and their various finished products is particularly active at the present time. The production of iron was never before on so large a scale, and when it is considered that there is but little railroad building, comparatively, now in progress, the immense general consumptive capacity of the country will be more fully realized. Many of the heavier consumers of pig metal have been supplied, and the market has become normal. Although most transactions of late have been for smaller amounts, the aggregate shows a larger tonnage. Ohio softeners are in increased demand for immediate shipment, and large consumers, it is said, would gladly add to their former contracts, for more extended deliveries, could they do so upon former terms. Both Lake Superior and coke irons are firmer and furnaces continue independent; they look forward to an increasing demand, heavier sales, and an increased volume of business generally. Southern furnaces are very firm and concessions are not now granted, as they are heavily sold. Still some of the Southern brands may be considered weak and still cutting rates, but they have no effect upon the general market whatever.

Pig Iron. — Quotations remain without material change as yet, but an advance is looked for later on—still some buyers are yet holding out for concessions, notwithstanding that all indications point to firmer prices and a rising market. We quote to-day for cash per ton of 2,240 pounds, f.o.b. Chicago, for Nos. 1 and 2, Lake Superior charcoal No. 3, for car wheels, Nos. 4 and 5 for malleable, $20.50@$21; Lake Superior coke Bessemer, $18.50; Lake Superior coke Bay View No. 1, $17@$17.50; No. 2, $16@$16.50; No. 3, $15.50@$16; Southern coke No. 1, $16.50@$17; No. 2, $15.50@$16; No. 3, $15@$15.50. Southern charcoal, $19@$19.50; standard Southern car wheel, $24@25; Ohio softeners, Hanging Rock, $18.50@$19; Jackson County, $18@$19; Hanging Rock cold blast, $26@$28; warm blast, $23@$25; No. 1 Scotch, according to brands, $26@$27; American Scotch, $19@$20; Bay View Scotch No. 1, $17; No. 2, $16; Chicago Scotch No. 1, $17; No. 2, $16; Emma Scotch, $19@$19.50; Black band, Hubbard Scotch, $19.50; Haselton, $20.25; soft Silvery, $18; Wellston No. 1, $19; No. 2, $18.50@$19; Hamilton No. 1, $18; Norton No. 1, $17.75@$18.25; Zanesville No. 1, $18.75@$19.25.

Bar Iron.—Bar iron is in good demand. Car builders are making large purchases—orders which were expected to have been placed some time ago; like many others, they looked for an easier market, but failed to find it. Trade continues active, and quotations are firmly maintained. Bedrock figures are: F. o. b. Valley Mills, $1.70, and a full run at mills till January next is assured. Local mills are asking $1.85@$1.90, half extras, and $1.80 for car iron. Stove trade is good, and dealers ask $2.10@$2.20, according to quantity.

Black Sheet Iron.—Mills report a more subdued demand, but small lots are in active request, and prices of last week maintained. Quotations are $3.10 f. o. b. mill for No. 27. Store prices are $3.20 for No. 24, $3.30 for Nos. 25 and 26, and $3.40 for No. 27. Smooth sheets at stores have advanced 60 cents per cwt.

Galvanized Sheet Iron.—The volume of orders and inquiry continue heavy. Mills find it difficult to supply the demand and are much behind with shipments. As a conservative measure and in justice to themselves they feel constrained to make an early advance to cover increased cost of production. Discounts for both cheap and standard brands are now 62½ per cent. on Juniata and 62½ and 5 per cent. on charcoal from store. Jobbing lots are quoted according to quantities.

Merchant Steel is in excellent demand and some large orders have been placed at advanced rates. Manufacturers continue firm in their views, and are satisfied with the outlook for trade during the coming season. We quote: Tool steel, $7.75@$8; specials, $12@$12.25; open-hearth machinery, $3; Bessemer machinery, $2.50@$2.60; open-hearth spring steel, $2.60@$2.65; tire, $2.50@2.60; toe calk, $2.70@$2.80; sleigh shoe, $2.40@$2.50; cutter shoe (T. & B.), $2.65@$2.70; crucible sheet steel, $7@$10; crucible spring, $3.75.

Structural Iron.—All the leading cities of the West are in the market for structural irons and steel, the demand for which is beyond all precedent, and bids fair to cause an early advance in prices. Many contractors are striving to place their specifications before the advance, which is apparently inevitable, is made. Many mills and foundries are behind with deliveries. We quote: angles, iron and steel, in car lots, f. o. b. Chicago $2.30@$2.40; universal plates, $2.50; sheared plates, $2.50; tees $2.70@$2.80; beams and channels $3.20. Store prices are: angles $2.50@$2.60; tees $2.80; beams and channels $3.70.

Plates, Tubes, etc., are in good demand from stores, with a heavy inquiry for mill lots; boiler tubes are somewhat scarce. Prices firm.

We quote as follows: tank iron, $2.70; tank steel, $2.90; heavy sheets from 10 to 14, $2.90@$3; steel sheets 10 to 14, $3.25@$3.50; shell iron, $3@$3.25; flange iron, $4@$4.25; flange steel, $3.50 shell steel, $3.25; boiler rivets, $4@$4.25; fire box iron and steel, $4.75@$5.50; boiler tubes 4½ inches and larger, 52½ per cent.; 2 to 4 inches, 50 per cent., and 1¼ inches and smaller, 45 per cent.

Nails.—Steel cut and wire nails are in good demand, and while prices of the former are steady the latter have advanced on account of the continued scarcity of steel rods. Manufacturers are unable to fill orders already placed. In this market the price of steel cut nails is $2.15 per keg and $2.10 per car load. Owing to the present scarcity of iron nails stores have increased quotations to $2.75 per keg and $2.70 per car lots.

Scrap Iron.—High grades of scrap are in steady demand at fair prices, supply good; cheaper classes neglected. We quote: Country mixed scrap, $13.50@$14, according to condition; No. 1 mill, $14@$14.50; light wrought, $9.50; horse shoes, $19.50@$20; axles, $23; cast machinery, $12.50@$13; stove plates, $9.50@$10; borings, $8.50@$8.75; wrought turnings, $11.50@$12; No. 1 railroad shop or forge, $19.50@$20; track scrap, $19.50.

Old Wheels and Rails.—The scarcity of material keeps values in dealers' hands at firm figures, but this is in a measure offset by the light demand. Old rails are now quoted $25@$25.50. Old wheels are scarce, and selling at $19.50@$20. Old steel rails $19@$20.50, according to length, freedom from frogs, etc. Guards and frogs, $18.50@$19.

Sheet and Bolt Copper, 25c., pound rates; sheet brass, copper and brass wire, 20 per cent. discount factory delivery.

Louisville. Aug. 12.

(Special report by HALL BROS. & CO.)

Quietness still prevails, though orders from car loads to 200, 300 and 1,000 tons have been taken at fair figures. Foundry grades seem to be scarce and are held firm. Some forge iron has been sold at cut figures, and for forward delivery. We look for an improvement, both in demand and price, by September. We quote as last:

Hot Blast Foundry Irons.		
Southern Coke No. 1	15.00@	15.25
" " No. 2	14.25@	14 50
" " No. 3	14.00@	14.25
Mahoning Valley, Lake ore mixture	17.75@	18.75
Southern Charcoal No. 1	17.00@	17.50
" " No. 2	16.50@	17.00
Missouri " No. 1	18.00@	18.50
" " No. 2	17 00@	17.50
Forge Irons.		
Neutral Coke	13.75@	14.00
Cold Short	13.75@	14.00
Mottled	12.75@	13.25
Car Wheel and Malleable Irons.		
Southern (standard brands)	22.00@	23.00
" (other brands)	18.00@	19.00
Lake Superior	22.50@	23.00

Pittsburg. Aug 14.

Raw Iron and Steel.—We can report a decidedly more active market, particularly for certain descriptions and Bessemer iron in particular. For some weeks past the sales of Bessemer iron were light, it seemed that buyers had an idea that the bottom had not been reached.

The sales on report this week will undoubtedly change their opinion; when consumers purchase three and five thousand ton lots those parties that have been holding off for sellers to make concessions will soon make up their minds that delays may be dangerous. The following is a comparison of Bessemer and Gray Forge for two years:

August, 1889.		*August*, 1890.	
Bessemer	$16.50@$16.85	Bessemer	$18.50@$18.75
Gray Forge...	14.50	Gray Forge...	15.25@ 15.50

The advance in ore coke and labor adds to the cost of pig iron, made at present from $3@$3.50 per ton; add that to the price paid last August, and you will readily perceive, taking the cost of the raw material into consideration, that iron is cheaper to-day than it was one year ago.

There is a large and increasing consumption, but the supply is large and seems so capable of further extension that certain consumers are not disposed to contract far ahead; while others who hold different views are willing to take large blocks, deliverable the next four months, at present prices.

As usual there is a wide difference in the views of dealers; one party will insist that the bottom has been reached, while the other party is just as positive that an advance is not far off. The reader can choose for himself.

A leading eastern iron dealer has this to say: "In crude iron the conditions are not so encouraging to the purchaser. The market has held firmly at the present rate for more than two months and every indication points to a continuance of this strength but there is no evidence of increasing activity or greater strength in the near future Consumption and production are normal; the output is well taken, and consequently there are no accumulations of unsold stocks to be dumped on the market."

The situation: Bessemer pig is steady at quoted rates; demand is increasing; gray forge sold at last week's prices; demand improving; muck bar firm and a shade higher; steel slabs and billets hardly as firm; bloom and rail ends selling at last week's figures; old material firm, advancing.

Coal and Coke Smelted Lake Ore.	
5,000 Tons Bessemer, Sept., Oct., Nov., Dec.	$18.50 cash.
3,000 Tons Valley Bessemer next 4 mos	19.00 cash.
2,000 Tons Valley Grey Forge, Sept., Oct	15.50 cash.
1,500 Tons Grey Forge, City Furnace	15.50 cash.
1,000 Tons Grey Forge, " "	15.50 cash.
1,000 Tons Grey Forge	15.25 cash.
1,000 Tons Grey Forge	15.25 cash.
1,000 Tons Bessemer, October, November	19.00 cash.
500 Tons Grey Forge	15.25 cash.
500 Tons Grey Forge, all ore	16.50 cash.
300 Tons Bessemer	18.75 cash.
200 Tons No. 2 Foundry	16.50 cash.
100 Tons No. 1 Foundry	17.50 cash.
Coke Native Ore.	
1,000 Tons Grey Forge	15 25 cash.
100 Tons No. 2 Foundry	16.50 cash.
50 Tons No. 2 Foundry	16.75 cash.
50 Tons No. 2 Foundry	16.25 cash.
100 Tons White	14.50 cash.
Charcoal.	
50 Tons No. 2 Foundry	22.75 cash.
50 Tons Cold Blast	27.00 cash.
50 Tons Warm Blast	27.25 cash.
50 Tons Cold Blast	28.00 cash.
Muck Bar.	
1,000 Tons Neutral	30.00 cash.
500 Tons Neutral	29.50 cash.
500 Tons Neutral	29.75 cash.
Steel Billets.	
1,000 Tons Billets at Works	30.75 cash.
1,000 Tons Billets "	30.60 cash
Steel Wire Rods.	
450 Tons American Fives	45.00 cash.
Ferro-Manganese.	
50 Tons 80 per cent., Pittsburg	75.00 cash.
50 Tons 80 per cent., Pittsburg	74.50 cash.
Bloom and Rail Ends.	
500 Tons Bloom Ends	22.50 cash.
500 Tons Rail Ends	22.75 cash.
Spiegel.	
500 Tons 20 per cent	32.50 cash.
Old Iron and Steel Rails.	
500 Tons American T's	27.60 cash.
200 Tons Sheet Steel Rails	22.25 cash.
Scrap Material.	
250 tons No. 1 W. Scrap net	$22.00 cash.
200 tons No. 1 W. Scrap net	22.50 cash.
200 tons Heavy O. H. Steel gross	22.50 cash.
125 tons Crucible Steel net	28.00 cash.
100 tons Iron Axles net	28.50 cash.
100 tons Leaf Steel net	23.00 cash.
75 tons Iron Axles net	28.50 cash.
50 tons Steel Axles net	29.00 cash.
25 tons old Car Wheels gross	18.50 cash.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Aug. 15.

Heavy Chemicals.—There is but little, if any, change in the market for heavy chemicals. Buyers are doing a hand-to-mouth trading, being unwilling to buy at present prices, and our special Liverpool correspondents inform us that pretty much the same state of affairs prevails on the other side. Writing under date of the 6th inst., Messrs. J. P. Brunner & Co. say in regard to the Chemical Union that doubts are expressed as to the scheme being carried through. However, a press dispatch received to-day from Glasgow says that the Chemical Union is now an accomplished fact. All the

chemical manufacturers of Great Britain, with three unimportant exceptions, have agreed to join their interests. The capital is about £8,000,000.

The following are the quotations given in this market:

Caustic soda, 74-76 per cent., 2·70c.@2·85c.; 76-77 per cent., 2·87½c.@2·90c.

Caustic soda ash is strong at 1.50c.

Carbonated soda ash, 48 per cent., 1·50c.@1·52½c.; 58 per cent., 1·47½c.@1·50c.

Sal soda, 97½@1c.

Bleaching powder is about 1·45c. and 1·25c. to 1·50 to arrive.

Acids.—This market offers but little in the shape of new or interesting features. Everything is quiet but not dull, and a fair amount of trading is going on all the time. We repeat our quotations: Acid, per 100 pounds in New York and vicinity: Acetic, $1.75@$2.25; muriatic, 18-degree, 80c. @$1.25; muriatic, 20-degree, 90c.@$1.50; muriatic, 22-degree, 90c.@$1.75; nitric, 36-degree, $2.75 @$3.50; nitric, 40-degree, $3.25@$4.50; nitric, 42-degree, $3.75@$4.75; sulphuric, 60-degree, 70@80c., and sulphuric, 66-degree, 80c.@$1.

Fertilizing Chemicals.—Only the trading that is ever going on during midsummer is to be noted in the market for fertilizing chemicals. Sales occur now and then, but, on the whole, the state of the market is very quiet. Our quotations this week are: High grade dried blood, $1.80@$1.85. For the low grade the price is $1.70@$1.75; Azotine, $1.90@$1.95. Tankage, high grade, 9 to 10 per cent. ammonia and 15 to 20 per cent. phosphate, $19@$20 per ton, and low grade 7 to 8 per cent. ammonia and 25 to 30 per cent. phosphate, $18@$18.50. Fish scrap, $20@$20.50 per ton f. o. b. factory. Sulphate of ammonia, $3.15@$3.20. Concentrated tankage, $1.70@$1.75. Refuse, bone black, guaranteed 70 per cent. phosphate, $18@$18.50 per ton. Dissolved bone-black is nominally 95c. per unit for available phosphoric acid, although on large lots prices might be somewhat reduced, and acid phosphate 80c. per unit for available phosphoric acid. Steamed bones, unground, $20@$23; ground, $25@$26.

Charleston rock, undried, $5.75 per ton; kiln-dried, $7@$7.25 per ton, f. o. b. vessels and cars respectively at the mines. Freights by sail from Charleston to New York, $2.75@$3.50 per ton. Charleston rock, ground $11.50@$12, ex vessel at New York.

Quotations are for 48 to 52 per cent. sulphate of potash, $1.12½ per 100 pounds for shipments from date; high grade manure salts, basis 90 per cent. sulphate of potash, $2.37½ per 100 pounds.

Kainit.—Very little is doing in this article, which is quoted at $9.75 for invoice weight, and $10 for actual weight.

Muriate of Potash.—Business in muriate is improving. During the week 600 tons to arrive were sold. There is considerable inquiry for it, and quotations are $1.77½@$1.82½. The agents for the United States and Canada state that they anticipate a good fall trade, judging from the present outlook. Last year a good deal of stock was carried over from the spring. This year, however, consumers bought no more than what was absolutely necessary to supply their wants, and the result has been that there is no accumulation of stocks. Just now the muriate trade is healthier than ever before.

Nitrate of Soda.—Very little is doing in this article. Everything is quiet. Quotations are $1.70 both for spot goods or for future delivery.

Brimstone.—Quotations for brimstone are, on the spot, $21.50 for seconds, with no thirds offered. To arrive, quotations are $20 and $20.50 for thirds and seconds respectively. It is reported that the foreign market is somewhat excited, and that prices will remain as at present for some time to come. Buyers are evidently not of this opinion, for they have held aloof from the market, and expect a decline. Actual business during the week has not amounted to much.

Liverpool. Aug. 6.

[Special Report by Messrs. J. P. Brunner & Co.]

With regard to heavy chemicals, buyers are operating very sparingly, but prices generally are very steady, most articles being in small compass.

Nothing new has transpired with regard to the proposed "Chemical Union," but the position is not very satisfactory at the moment, and some doubts are now expressed as to the scheme being carried through.

Soda ash is in limited demand, but as makers have little to sell prices are firm at 1 5/16d.@1½d. for caustic ash, and 1¼d.@1½d. for carbonated, according to brands.

Soda crystals are firm at £3 5s.@£3 10s. per ton.

Caustic Soda.—There is little actual business passing, buyers being afraid to operate at the present high values. At the same time there is little offering, and quotations are steady, at £8 17s. 6d.@£9 for 60 per cent.; £9 16s. 3d@£10 for 70 per cent.; £10 15s.@£11 for 74 per cent., and 76 per cent., none offering.

Bleaching powder receives little attention from buyers, and £5 12s. 6d.@£5 15s. are nearest values for hardwood.

Chlorate of potash firm, at 5d. per pound, but we hear of little business.

Bicarb. soda in demand at £5 15s. per ton and upward for 1 hundredweight kegs, according to brand and quantity, with usual allowances for larger packages.

Sulphate of ammonia firm at £11 15s. per ton for good gray 24 per cent. in double bags, f.o.b. Liverpool, and this price paid by American buyers.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, August 15.

The disturbances among the brick men have caused an uneasy feeling in the market for building materials. Some builders are undecided as to whether or not serious complications will ensue. This element of uncertainty has prevented large business.

Lime.—The few arrivals that have come in were all disposed of without much trouble. The lime shippers are not sending any more lime to this market than is absolutely necessary to meet current demands. Quotations continue as follows: Rockland, common and finishing, 90c. and $1.20; St. John, common and finishing, 85c.@95c.; Glen Falls, common and finishing, 85c.@1.10.

Brick.—In anticipation of the troubles that may be born of the present misunderstanding between brick manufacturers and their employés, a great many builders are taking up all the brick that is offered to them. In consequence of this the sales this week have been good-sized, and the supply has also been good. Of course, the market is rather unsettled, and by a great many people the worst is feared. In the appended Notes of the Week we give an account of the matter as it now stands. Quotations are: Haverstraws, $5.25@$6 per M; Uprivers, $5@$5.50; Jerseys, $4.50@$5, and Pales, $3@3.25.

NOTES OF THE WEEK.

At the meeting of the Brick Manufacturers' Association of New York and New Jersey, in session in this city on the 11th inst., the members of the association subscribed half a million dollars to sustain the four boycotted brick manufacturing firms at Verplancks Point, concerning which mention was made in our last week's issue.

The question, with a labor organization running a boycott on one side and the manufacturers threatening to run a bigger boycott on the other, is a menacing one. The quarrel, as we have already briefly alluded to, arose over the boycott of the bricks of manufacturers that employed non-union workmen. Under instructions from the walking delegates union men refused to lay the bricks of the offending manufacturers. The Manufacturers' Association decided to shut off the supply of bricks in New York, Brooklyn and Jersey City, unless the boycott of the Haverstraw men was raised.

If both sides persist in maintaining their present attitude the building trade in the three cities named will be paralyzed next week, and a loss of many millions, attended by much suffering, will result. There is said to be a greater number of contracts under way now than ever before at the corresponding term, and the serious effect of a boycott by the Manufacturers' Association, which supplies about 90 per cent. of the bricks used in New York and Brooklyn, can be imagined.

As the matter stands now, no one knows any more than we have written above. The Manufacturers' Association will hold a meeting on the 18th inst., the result of which will be watched with considerable curiosity, not to say anxiety. It is to be hoped that amicable measures will be adopted to settle the existing difficulties.

The Carpenters' Council, of Chicago, Ill., on the 13th inst., adopted the following resolutions:

"Whereas an agreement was entered into between the Boss Carpenters and Builders Association and the United Carpenters' Council, the terms of which were mainly that the scale of wages should be 35 cents an hour until August 1st, and after that date and until March 1, 1890, 37½ cents an hour; and whereas the Boss Carpenters and Builders have refused to live up to the provisions of the above agreement after August 1st; and whereas we deplore the occasion that requires the assertion of our rights and an enforcement of extreme measures which we have hitherto endeavored to avoid; herefore be it

Resolved, that we, the United Carpenters' Council, in meeting assembled, do hereby order out on general strike all carpenters in the City of Chicago under our jurisdiction on Monday, September 1st, 1890."

IMPORTS AND EXPORTS OF METALS AT NEW YORK FROM AUGUST 2 TO AUGUST 9 AND FROM JANUARY 1.

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Amer. Metal Co....		272
Hendricks Bros....		50
La Marche's Sons, H....		5
Lewisohn Bros....		50
Meyer, G. A. & E..		9
Milne & Co....		74
Muller, Schall & Co....		123
Total....		583
Corres. date, 1889..	108	647
Pig Lead.	Lbs.	Lbs.
Caswell, E. A....		111
Hendricks Bros....		100
Schultz & Co., A..		98
G. W. Sheldon....		149
Total....		458
Corres. date, 1889..	11	140
Tin.	Tons.	Tons.
Abbot, Jere, & Co.		100
Amer. Metal Co....		2,125
Bidwell & French.		815
Bruce & Cook....		10
Carter, Hawley & Co....		75
Cohen, H....		20
Cort & Co., N. L....		70
Crooks & Co., R....		85
Davol & Son....		34
Hendricks Bros....		26
Knauth & Kuhne..		10
Lehmaier, S., & Co.		102
Lewisohn Bros....		20
Merchant & Co ..		30
Muller, Schall & Co.		620
Naylor & Co....		1,146
Nissen, Geo....		10
Phelps, Dodge & Co....		2,350
Thomson, A. A. & Co....		40
Thomson, D. & Co.		60
Townsend, & Co., J. R....		50
Trotter & Co, N..		75
Total....		7,873
Corres. date, 1889..		6,597
Tin Plates.	Boxes.	Boxes.
Bruce & Cook....	3,612	84,784
Byrne & Son....		1,000
Central Stamp. Co.		48,414
Coddington & Co...	3,012	80,205
Cohn & Co	577	14,179
Con. Fruit Jar Co.		120
Corbiere F. & Co..		7,407
Cort & Co..	13,452	121,454
Crooks & Co....	1,079	50,290
De Milt & Co, H R.	428	4,324
Dickerson, V. D. & Co	4,011	224,793
Fenton, D. E....		1,037
Haberman, F....		66
Herring, Chas. E. .		1,000
Iron Clad Mfg. Co.		379
Lalance & G. M. Co.		8,533
Lazard Bros.		1,048
Lehmaier, Schw'z & Co...		200
Merchant & Co....	134	18,563
Mersick & Co.. ..	274	7,521
Morewood & Co.. .		37,217
Newell Bros.		416
Payne, S. H. & Co.		684
Pratt Mfg. Co....	6,820	88,558
Phelps, Dodge & Co		525,999
Shepard & Co....	445	3,993
Taylor, N. & G....		1,229
Thomson & Co., A. A.	1,058	74,568
Warren, J. M....	790	4,320
Wheeler & Co....	198	20,428
Whittemore & Co.	360	12,953
Wolff & Reesing...		2,077
Wright, Peter & Co.		227
Total....	36,320	1,447,986
Corres. date, 1889..	29,471	1,481,990
Pig Iron.	Tons.	Tons.
Abbott & Co., Jere.		200
Baldwin & Co., A..		807
Baldwin Bros. & Co..		170
Crocker Bros....		1,100
Crooks & Co., R....		5
Dana & Co..		150
Drummond & Co...		400
Geisenheimer & Co		76
Hagermeyer & Brun		30
Henderson Bros. ..		100
Irvin. R. I. & Co..		300
Lillienberg, N....		1,909
Naylor & Co....		150
Pierson & Co....		30
Sheldon, G. W. & Co.		200
Stetsson & Co., G. W.		1,925
Williamson, J. & Co.	100	1,550
Total....	100	9,102
Corres. date, 1889..	700	18,032
Steel Blooms, Billets, and Slabs.	Tons.	Tons.
Abbott & Co....		5
Baldwin Bros. & Co....		2
Dana & Co....		1,670
Downing, R. F. & Co.		107
Henderson Bros....		1
Martin & Co .		80
Milne, A., & Co..		68
Pope, Jas. E., Jr.		61
Richards & Co., C. B.		1
Roebling's Sons, J. A.		2,074
Wolff, & Co., R. H.		60
Total....		4,129
Corres. date, 1889..		50,017
Bar Iron.	Tons.	Tons.
Abbott & Co., Jere.		736
Bacon & Co....	193	1,036
Crocker Bros....		77
Dickerson, Van Dusen & Co....		6
Downing & Co....		285
E. J. Jacobus....		8
Fuller, Dana & Fitz.		11
Holt, H. N....		60
Lillienberg, N....		447
Lundberg, G....		1,957
Milne & Co....	69	918
Muller, Schall & Co.		289
Naylor & Co....		337
Page, Newell & Co.	41	1,604
Plenty, J		14
Wilson, J. G....		3
Total....	303	7,788
Corres. date, 1889...	117	5,366
Scrap Iron.	Tons.	Tons.
Crossman & Co., W. H.		30
Muller, Schall & Co.		18
Samper & Co., S.		186
Stevens, Corvin & Co....		30
Ward, J. E. & Co..		492
Total....		756
Corres. date, 1889..		1,238
Steel and Iron Rods.	Tons.	Tons.
Abbott & Co....	231	7,024
American S. Co....		665
Bacon & Co....		463
Carey & Moen....	30	406
Cooper, Hewitt & Co....		371
Dana & Co.		498
Downing & Co....		129
Galpin, S. A....		1,206
Greely & Co. C. S.		35
Hazard Mfg. Co..	21	328
Jacobus, E. Y....		2
Lee, James & Co...		1,399
Lillienberg, N. ..		300
Lundberg, G....		126
Milne & Co....		756
Muller, Schall & Co.		732
Naylor & Co....		3,987
Page, Newell & Co.		1,179
Roebling's Sons, J. A.		2,157
Schulze & R.		1
Temple & Lockw'd ..		6
Wessel & Co....		21
Wiebusch & Ho...		4
Wood & Niebuhr..		25
Wolf & Co., R. H..	66	2,831
Total....	348	24,651
Corres. date, 1889...	1,043	31,510
Old Rails.	Tons.	Tons.
Bowring & Archibald....		340
Dana & Co....		350
Frankfort. M....	50	4,177
Henderson Bros...		300
Hernsheim, L		350
Mosle Bros....		123
Naylor & Co....		1,968
Sawyer, Wallace & Co....		610
Total....	50	8,218
Corres. date. 1889...		9,135
Spiegeleisen.	Tons.	Tons.
Abbott, Jere & Co.		2,725
American Metal Co....		100
Blakely & McLellan....		1,684
Crocker Bros.... ..	277	16,775
Crooks & Co, R..		106
Dana & Co....		15,900
Foley, F....		50
Geisenheimer & Co.		413
Hernsheim, L....	552	15,749
Holt, H. N....		200
Naylor & Co....		9,931
Perkins, C. L....		1,422
Sachs & Richmond.		2
Whittemore, H. & Co.	15	55
Total....	844	64,268
Corres. date, 1889...	534	45,561
Iron Ore.	Tons.	Tons.
Baiz, Jacob....		67
Bowring & Archibald....		4,092
Earnshaw, A....		3,517
Ennis, Andrew....		438
Flores & Co., R. de	241	13,404
Johnson & Co., L..		5,030
Total....	241	26,548
Corres. date, 1889..	429	8,660

EXPORTS.

Copper.	Pounds.	Pounds.
Abbott & Co., Jere.		2,522,603
Amer. Met. Co., La.		904,208
Barber & Co....		13,750
Belmont, Aug. & Co		1,763,974
Burgass & Co....		173,734
French, Edye & Co.		135,374
Heidelbech, Sichel-heimer & Co		672,608
Muller, Schall & Co.		16,250
Sawyer, W'l'ce & Co.		22,796
Seamen, S. H.		66,950
Ward, J. E. & Co.		100,000
Wil'ms & T'hune.		112,004
Total....		3,579,251
Corre. date, 1889...	102,258	4,268,576
Copper Matte.		
American Metal Co		2,747,079
Lewisohn Bros.		1,703,846
Nichols, Geo. H...		267,202
Paulsen, Wm....		1,039,428
Wil'ms & T'hune..		2,848,706
Total....		8,606,261
Corres. date 1889..	165,806	17,230,957

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied	Assessments. Date and amount of last.	Dividends. Total paid.	Dividends. Date and amount of last.
1	Adams, S. L.	Colo	$1,500,000	150,000	$10	*	....	$555 00 Jan., 1887 .0
2	Adice, S. & ...	Mont	10,000,000	400,000	25	*	....	850,000 July 1890 .06¼
3	Alma & Nel Wood C., S.	Idah	300,000	30,000	10	*	....	60,000 Jan 889 .50
4	American & Nettie, C.	Colo.	.....	300,000	..	.....	.....	150,000 Nov. 1889 .10
5	Amy & Silversmith, S.	Mon.	.....	341,419	..	.....	.....	247,530 Aug. 1887 12½
6	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000 Apl. 1875	$1.00	66,000 Aug. 1890 1.00
7	Argenta, S.	Nev.	10,000,000	100,000	100	33b,000 July 1889	.10	40,000 Feb 1880 .20
8	Aspen Mg. & S., S. L.	Colo.	2,000,000	200,000	10	*	....	480,000 Aug 1890 .10
9	Aurora, L.	Mich	2,000,000	100,000	20	*	....	155,000 Oct. 1887 1.37½
10	Badger, S.	Oat	250,000	50,000	5	.....	.....	37,500 Mar. 1890 .25
11	Bassick, S.	Colo.	10,000,000	100,000	100	*	....	400,000 Mar. 1884 1.00
12	Belle Isle, S.	Nev.	10,000,000	100,000	100	.....	.....	300,00 Dec 1879 .25
13	Belcher, G. S.	Nev.	10,400,000	104,000	100	2,028,000 Apl. 1890	.50	15,397,00 Apl 1876 1.00
14	Bellevue Idaho, S. L.	Idah.	1,250,000	125,000	10	120,000 Dec. 1889	.25	200,000 Jan. 1887 10
15	Bodie Con., G. S.	Cal.	10,000 000	400 000	100	575,000 Nov 1889	25	1,602,572 Apl. 1885 .50
16	Boston & Mont., G.	Mon	2,500,000	250,000	10	*	....	530,000 Jan 1888 .15
17	Boston & Mont., C. &	Mon	2,500,000	100,000	25	*	....	1,450,000 Aug. 1890 1.50
18	Breece, S.	Colo	5,000,000	200,000	25	*	....	2,00 Feb. 1890 .01
1	Brooklyn Lead, L. S.	Utah	500,000	50,000	10	.....	.....	127,000 July 1887 .05
20	Bulwer, G.	Cal	10,000,000	400,000	10	130,000 Aug. 1889	.25	175 000 Jan. 1884 .10
21	Bunker Hill & Sull.	Idah.	3,000,000	300,000	10	*	....	150,000 Oct. 1883 .06⅔
22	Buena, G.	Oak	10,000,000	100,000	100	505,000 May 1885	.15	176,00 Aug. 1890 .08
23	Calliope, S.	Colo.	2,000,000	1	....	*	....	90,000 Apl. 1890 .01
24	Caumet & Hecla, C.	Mich	2,500,000	100,000	25	1,200,000	....	34,350,000 May 1890 5.00
25	Carbonate Hill, S. L.	Colo.	1,500,00	300,000	10	*	....	80,000 Apl. 1884 .05
26	Carlisle, G.	N. M	1,000,000	200,000	5	.....	.....	175,000 Dec. 1888 .12½
27	Castle Creek, G.	Idah	100,000	100,000	1	*	....	51,000 Oct. 1888 .03
28	Cataipa, S. L.	Colo.	3,000,00	300,000	10	*	....	270,000 May 1884 .10
29	Central, C.	Mich	50,000	200	25	100,000 Sept 1861	.06	1,950,000 Feb. 1880 1.00
30	Chrysolite, S. L.	Colo	10,000,000	200,000	50	*	....	1,850,00 Dec 1884 .25
31	Colorado Central, S. L.	Colo.	2,750,00	275,000	10	.....	.....	406,256 Aug. 1889 .05
32	Confidence, S. L.	Nev.	.....	24,980	..	306,160 Mar. 1890	.75	199,680 Apl. 1889 1.00
3	Cons. Cal. & Va., G. S.	Nev.	21 000 000	216,000	100	108,000 Jan. 1885	.20	3,466,80 Apl. 1889 .25
34	Contention, S.	Ariz.	12,500,000	250,000	50	*	....	12,587,500 Dec. 1884 .25
35	Cop. Queen Cons., C.	Ariz.	1,400 00	140,000	10	*	....	210,000 Feb. 1889 .50
36	Crescent, S. L. G.	Utah	15,000,000	600,000	25	*	....	228,000 Oct. 1888 .03
37	Crown Point, G. S.	Nev.	10 000 00	100,000	100	2,850,000 Sept 1880	.50	11,580,000 Jan 1877 2.00
38	Daly, S. L.	Utah	3,000,000	150,000	20	*	....	1,575 000 July 1890 .25
39	Deer Creek, L. G.	Idan.	1 000,000	200,00	5	.....	.....	20,000 Jun. 1889 .05
40	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*	....	11,000,000 Nov. 1887 .10
41	Derbec & Grav., G. S.	Cal.	10,000,00	100,000	100	90,000 Dec. 1881	.10	210 000 Oct 1889 .10
42	Dunkin, S. L.	Colo.	5,000,000	200,000	25	*	....	390,000 Oct. 1889 .05
43	Dunstone, G. S. L.	Mon	1, 000,000	200,000	5	*	....	8,00 Nov 1888 .03
44	Eclipse.	Colo	100,000	100,000	1	.....	.....	20,000 Nov. 1887 .10
45	Elkhorn, G. S.	Mon.	1,000,000	100,000	10	50,000 July 1883	.50	850,000 July 1887 .05
46	Empire L., G.	Mont	500,000	100,000	5	*	....	70,500 Oct. 1887 .37½
47	Eureka Con., G. S. L.	Nev.	5,000,000	50,000	100	550,000 Jun. 1880	.50	1,497 50 Aug. 1890 .25
48	Evening Star, S. L.	Colo	500,000	50,000	10	*	....	1,45 .01 Dec. 1889 .25
49	Excelsior, G.	Cal.	10,000,000	100,000	100	560,000 Sept 1885	1.00	975,00 Oct. 1888 .25
50	Father de Smet, G.	Dak	10,000,000	100 000	100	200,000 Nov 1878	1.00	1,125,000 Dec 1885 .20
51	Franklin, C.	Mich	1,000,000	40,000	25	220,000 Jun. 1871	....	930,000 Jan. 1889 2.00
52	Freeland, G. S. C.	Colo.	5,000,00	200,000	25	*	....	190,000 July 1888 .10
53	Garfield L., G. S.	Nev	500,000	100,000	5	.....	.....	95,000 Apl. 1888 .12½
54	Gould & Curry, G. S.	Nev.	10,800,000	108,000	100	4,495,500 Apl. 1890	.30	820,80 Oct 1871 10.00
55	Grand Prize, S.	Nev.	10,000,000	100,000	100	715,000 Nov. 1889	.30	525,00 Jan 1880 .30
56	Granite, S. L.	Idan.	500,000	500,00	1	*	....	28.4 Oct. 1879 .02
57	Granite Mountain, S.	Mont	10,000,000	400,000	25	.....	.....	9 200,00 July 1890 .50
58	Green Mountain, G.	Cal.	1,250,000	125,000	10	*	....	212,000 Nov. 1884 .07½
59	Hale & Norcross, G.	Nev.	14,200,000	142,000	100	5,086,000 July 1887	.50	1,162,000 July 1888 .50
60	Hecla Con., S. L. C.	Mont	1,500,000	30,000	50	*	....	1,500,000 Apl 1888 .50
61	Helena Mg. & Red, S. & L.	Mont	3,315,000	663,000	5	*	....	197,97 July 1888 .06
62	Holmes, S.	Nev.	10,000,000	100,000	100	325,000 Mar. 1890	.25	75,000 Apl 1889 .25
63	Holyoke, G.	Utah	200,000	200,000	1	.....	.....	27 00 Feb 188 .10
64	Homestake, G.	Dak.	12,500,000	125,000	100	200,000 July 1878	1.00	5,581,250 A g. 1890 .10
65	Honorine, S. L.	Utah	500,00	250,000	2	37,500 Apl. 1889	.05	125.00 Sept. 1887 .05
66	Hope, S.	Mont	1,000,000	100,000	10	*	....	233,252 Apl. 1888 .25
67	Horn Silver, S. L.	Utah	5,000,000	100,000	25	*	....	4,150,00 Jun. 1890 .12½
68	Hubert, G.	Colo.	1,000,000	1 mil'n	1	*	....	247.00 Dec. 1889 .00⅔
69	Iano, G.	Cal.	310,000	3,100	100	.....	.....	5,325,900 Dec. 1889 5.00
70	Ideal, S. L.	Colo.	1,500,000	50,000	10	.....	.....	15,000 Oct. 1889 .05
71	Illinois, S.	N. M.	100,000	100,000	1	*	....	45,000 Apl 1889 .20
72	Independence, S.	Nev.	10,000,000	100,000	100	340,000 Oct. 1886	.20	225,000 Sept 1879 .25
73	Iron Hill, S.	Oak.	2,500,000	250,000	10	134,000 July 1889	.08	156,25 Nov 1887 .07½
74	Iron-Silver, S. L.	Colo.	10,000,000	200,000	20	*	....	2,500,00 Apl. 1889 .20
75	Jackson, G. S.	Nev.	5,000,000	50,000	100	237,500 Nov 1880	.30	55,000 Jun 1889 .10
76	Jay Gould, S.	Mont	2,000,000	40,000	5	*	....	439,000 May 1890 .04
77	Jocunstita, S.	Mex.	2,500,000	250,000	10	.....	.....	1,200,000 Feb 188. .50
78	Jumbo, G.	Colo	2,000,000	200,000	10	.....	.....	35,000 Oct. 1887 .02½
79	Kearsarge, C.	Mich	1,250,000	50,000	25	190,000 Oct 1887	1.00	100,000 Jan. 1890 2.00
80	Kentuck, S.	Nev.	3,000,00	300,000	100	369,000 Dec. 1889	.30	1,350,000 Jan. 1884 .10
81	La Plata, S. L.	Colo.	2,000,00	200,00	10	*	....	610,000 Sept 1882 .30
82	Leadville Cons., S. L.	Colo.	4,000,000	100,00	10	*	....	4423,000 Apl. 1889 .05
83	Lexington, G. S.	Mont	4,000,000	40,000	100	.....	.....	609,000 Jan. 1885 2.00
84	Little Chief, S. L.	Colo.	10,000,000	200,000	50	*	....	810,000 Jan. 1890 .05
85	Little Pittsburg, G.	Colo.	20,000,000	200,000	100	*	....	1,050,000 Mch. 1889 .50
86	Little Katie	Colo.	10,000,000	200,000	..	.....	.....	30,000 Jun. 1890 .02
87	Mammoth	Utah	.....	.....	..	*	....	30,000 Aug. 1890 .10
88	Manhattan, S.	Nev.	10,000,000	100,000	100	100,000 Feb. 1890	25	140,000 Dec 1886 .20
89	Mary Murphy, G. S.	Colo.	350,000	3,500	100	*	....	175,000 May 1885 5.00
90	Matchless, S.	Colo.	500,00	500,000	1	.....	.....	15,000 Feb. 1889 .00½
91	May Mazeppa	Colo.	1,000,000	100,000	1	.....	.....	20,000 Aug 1890 .01
92	Minnesota, G.	Mon	4,000,00	40,000	25	120,000 Apl. 1886	1 00	1,826,000 Mar. 1890 ....
93	Mono, G.	Cal.	5,000,000	50,000	100	102,850 Nov. 1889	.25	12,50 Mar 1886 .25
94	Montana, L., G. & S.	Mont	3,300,00	330,000	5	*	....	3,515,306 Aug. 1890 .06
95	Morning Star, S. L.	Colo.	1,000,00	100,000	10	.....	.....	850,000 Dec. 1889 .20
96	Moulton, S.	Mont	2,000,00	400,000	5	*	....	380,000 Dec. 1887 .07½
97	Mount Pleasant, G.	Cal.	150,000	150,000	1	*	....	150,000 Feb. 1887 .30
98	Mt. Diablo, S.	Nev	5,000,00	50,000	100	137,500 Jun. 1880	2.00	163,000 Oct 1889 .20
99	Napa, G.	Cal.	700,00	100,000	10	*	....	370,000 July 1890 .10
100	Navajo, G. S.	Nev.	10,000,000	400,000	100	485,000 Apl. 1888	.30	369,000 Apl. 1889 .10
1 1	New Guston, S.	Colo.	500,000	100,000	5	*	....	337,500 Apl 1 90 .50
102	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*	....	30,000 Dec. 1885 .06⅔
1 3	Northern Belle, S.	Nev.	5,000,000	50,000	100	425,000 Jan. 1884	8.30	2,400,000 Apl. 1885 .50
1 4	North Belle Isle, S.	Nev.	10,000,00	100,000	100	400,000 Sept 1889	.20	230,000 May 888 .50
1 5	North Star, G.	Mont	1,000,000	100,000	10	.....	.....	250,000 Mar 1889 .50
106	Ontario, S. L.	Utah	16,000,000	160,000	100	*	....	11,160,0 July 1890 .10
10	Ophir, G. S.	Nev.	10,000,000	100,000	100	4,159,440 May 1889	.50	1,985,800 July 1884 1.00
1 8	Original, S. C.	Mont	1,500,00	60,000	25	*	....	123,000 July 888 .05
1 9	Oro	Colo.	.....	.....	..	.....	.....	60,000 Jun. 1890 .20
110	Osceola, C.	Mich	1,250,00	50,00	25	480,000 Apl. 1876	1.60	1,372,500 Sept 1889 1.00
111	Oxford, G.	Colo.	125,00	50,000	1	*	....	75,50 Sept 1889 .02
112	Paradise Valley, G. S.	Nev.	10,000,000	100,000	100	57,000 Apl. 1888	.15	1,000,000 Apl 1887 .10
113	Parrot, C.	Mont	1,800,000	180,000	10	*	....	642,000 Jun 1890 .03
114	Peacock, S. & C.	N.M.	2,000,000	200,000	10	*	....	60,000 Nov. 1886 ....
115	Plumas Eureka, G.	Cal.	1,406,250	140,625	10	*	....	2,548,046 Oct. 1889 .37½
116	Plutus, G. S. C. L.	Colo	2,000,000	200,000	10	*	....	20,000 Feb. 1889 .10
117	Pilgrim Con., G.	Cal.	5,000,00	100,000	50	*	....	2,280,000 Feb 1885 .40
118	Quicksilver, Pref., G.	Cal.	4,369,00	43,000	100	*	....	1,705,731 Aug. 1890 1.50
119	Quicksilver, Com., G.	Cal.	5,700,000	57,000	100	*	....	643,86 Jun 1885 .40
120	Quincy, C.	Mich	1,000,00	40,000	25	200,000 Dec. 1862	....	5,570,000 Aug 1890 5.00
121	Republic, C.	Mich.	5,000,000	100,000	50	400,000 Dec. 1889	.30	4,312,58 Jun 1887 1.25
122	Richmond, S.	Nev.	1,350,00	54,000	25	*	....	99,780 Feb. 1880 .50
123	Ridge, C.	Mich.	500,000	50,000	25	219,936 Mar 1886	.50	585,000 Mar. 1890 .05
124	Robinson Cons., S. L.	Colo.	10,000,000	200,000	50	*	....	100,00 Dec. 1888 .50
125	Robert E. Lee, S. L.	Colo	10 000.00	800,000	10	.....	.....	4,460,000 July 1886 3.00
126	Savage, S.	Nev.	11,200,000	112,000	100	6,542,000 July 1889	.60	7,50 Apl 1883 .01
127	Shoshone, G.	Idan.	150,000	150,000	1	.....	.....	1,568,146 Apl. 1888 .12½
128	Sierra Buttes, G.	Cal.	2,225 000	122,500	10	*	....	102,000 Jan. 1871 1.00
129	Sierra Nevada, S. L.	Nev.	10,000,000	100,000	100	6,250,000 Oct. 1889	.50	270,000 Apl. 1889 .10
130	Sierra Nevada, S. L.	Idaho	1,000,000	1	..	*	....	40,000 May 1889 .02
131	Silver Cord, G. S. L.	Colo.	4,500,00	450,000	10	.....	.....	270,000 Apl 1889 .10
132	Silver King, S.	Ariz.	10,000,00	400,000	100	50,000 Jan. 1890	.30	1,950,000 July 1887 .25
133	Silver Sig., of L. V.	N. M.	500,000	500,000	1	*	....	150,000 Aug. 1890 .05
134	Silverton, G. S. L.	Colo.	2,000,00	200,000	10	*	....	50,000 Jan 1884 .25
135	Small Hopes Cons., S.	Colo.	5,000,00	250,000	20	*	....	3,137,50 Jun 1889 .10
136	Spring Valley, G.	Cal.	200,00	200,000	1	50,000 Oct. 1886	.25	3,595,000 Jun. 1885 .05
137	Standard, G. S.	Cal.	10 000.00	100,000	100	50,000 Feb. 1890	.25	155,000 Nov. 1881 .05
138	Stormont, S.	Utah	500,00	50,000	1	*	....	544.00 Dec. 1887 .20
139	St. Joseph, L.	Mo..	1,500,00	150,00	10	*	....	9.00 Apl. 1886 .02½
140	Swansea, G.	Colo.	600,000	60,000	10	*	....	100,000 Nov 1881 .20
141	Tamarack, C.	Mich.	1,000,00	40,000	25	520,000 Apl. 1885	3.00	1,56 ,000 July 1890 8.00
142	Tombstone, S. L.	Ariz.	12,500,000	250,000	50	*	....	1,250,000 Apl. 18 2 .10
143	United Verde, C.	Ariz.	3,000,00	300,000	10	*	....	9,000 Sept. 1884 ....
144	Valencia, M.	N. H.	150,000	1,500	100	*	....	41,250 Apl 1886 2.50
145	Viola L., S. L.	Idah	750,000	150,000	5	*	....	272,5 0 Oct. 188. .07½
147	Ward Cons., S. L.	Colo.	2,000,000	200,000	10	.....	.....	2 ,000 Dec. 1889 .10
148	Yankee Girl	Colo.	2,500,00	250,000	10	*	....	1,975,00 July 1887 .10
149	Yellow Jacket, G. S.	Nev.	12,000,000	120,000	100	5,508,000 Mar 1889	.50	2,184,000 Aug 1871 1.50
150	Webb City, L. & ...	Mo.	55,000	11,000	5	.....	.....	4 4 0 July 1889 .10
151	Woodside	Utah	.....	.....	..	.....	.....	25,000 Oct. 1889 .25
152	Young America	Cal.	.....	.....	..	.....	.....	175,000 .... 1889 .10

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par Value.	Assessments. Total levied.	Assessments. Date & am't of last.
1	Agassiz Cons., S. L.	Colo	$2,500,000	50,000	$50	* ....
2	Alleghany, S.	Colo.	5,000,000	50 ,000	10	....
3	Alloues, C.	Mich	2,000,000	80,000	25	$737,000 Jan. 1890 7½
4	Alpha Con., G. S.	Nev.	3,000,000	30,000	100	588,750 July 1888 .50
5	Alta, S.	Nev.	10,080,000	100,800	100	2,248,800 Sept 1888 .50
6	Amador, G.	Cal.	400,000	200,000	2	* ....
7	American Flag, S.	Colo	1,250,000	125,000	10	300,000 Jun 1877 ....
8	Amity, S.	Colo	250,000	250,000	1	....
9	Angio-Montana, Lt.	Mon.	600,000	120,000	5	....
10	Astoria, G.	Cal.	200,000	100,000	2	* ....
11	Barcelona, S.	Nev.	5,000,000	200,000	25	* ....
12	Bechtel Con., G.	Cal.	10,000,000	100,000	100	173,500 Jan. 1883 .10
13	Belmont, S.	Nev.	5,000,000	50,000	100	735,000 Apl 1886 .10
14	Best & Belcher, G. S.	Nev.	10,080,000	100,800	100	2,180,590 Jan. 1890 .25
15	Big Pittsburg, S. L.	Colo.	20,000,000	200,000	100	* ....
16	Bi-Metallic, S.	Mon.	5,000,000	200,000	25	* ....
17	Black Oak, G.	Cal.	3,000,00	300,000	10	* ....
18	Boston Con., G.	Cal.	10,000,000	100,000	100	170,000 Nov 1883 .25
19	Bremen, S.	N. M	5,000,000	500,000	10	* ....
20	Brownlow, S.	Colo.	250,000	250,000	1	* ....
21	Brunswick, G.	Cal.	2,000 00	400,000	5	* ....
22	Buillon, G. S.	Nev.	10,000,000	100,000	100	4,007,000 Aug. 1888 .50
23	Calaveras, G.	Cal.	500,00	500,000	1	* ....
24	Carissa, G.	Wy	500,000	100,000	5	* ....
25	Carupano, G. S. L. C.	Ven.	200,000	100,000	2	* ....
26	Cashier, G. S.	Colo.	500,000	250,000	2	* ....
27	Charles Dickens, G. S.	Idan.	1,250,000	250,00	5	* ....
28	Cherokee, G.	Cal.	1,500,000	150,000	10	....
29	Chollar, S.	Nev.	11,200,000	112,000	100	1,484,000 July 1889 .50
30	Cleveland, T.	Dak.	1,000,000	500,000	2	* ....
31	Colchis, G.	N. M.	500,000	50,000	10	....
32	Commonwealth, S.	Nev.	10,00 ,00	100,000	100	170,000 Nov 1888 .50
33	Comstock, G. S.	Nev.	10,000,000	100,00	100	30 000 Mar. 1887 .15
34	Con. Imperial, G. S.	Nev.	5,000,00	50,000	100	1,402,500 Nov. 1889 .05
35	Con. Pacific, G.	Cal.	6,000 00	60,000	100	192,000 Oct. 1889 .10
36	Cons. Silver, S.	Mo.	2,500,00	250,000	10	....
37	Crescent, S. L.	Colo.	3,000,00	300,000	10	* ....
38	Crocker, S.	Ariz.	10,000,000	100,000	100	135,000 Jan. 1890 .10
39	Crowell, G.	N. C	500,000	500,000	1	* ....
40	Dahlonega, G.	Ga.	250,000	250,000	1	* ....
41	Dandy, S.	Colo.	5,000,00	500,000	10	* ....
42	Decatur, S.	Colo.	1,500,00	300,000	5	* ....
43	Denver City, S. L.	Colo.	5,000,00	500,000	10	* ....
44	Denver Gold, G.	Colo.	300,00	60,000	5	* ....
45	Durango, G.	Colo.	500,000	500,000	1	* ....
46	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	990,000 Mar. 1886 1.0
47	El Cristo, G. S.	U.S.C	1,000,00	500,000	2	* ....
48	El Dorado, G.	Cal.	1,000,00	250,000	4	* ....
49	El Tabasto, G.	U.S.C	1,000,00	530,000	2	* ....
50	Empire, S.	Utah	10,000,00	100,000	100	* ....
51	Eureka Tunnel, S. L.	Nev.	10,000,00	100,000	100	* ....
52	Exchequer	Nev.	10,000,00	100,000	100	515,000 Apl. 1889 .25
53	Found Treasure, G. S.	Nev.	10,000,000	100,000	100	30,530 Apl. 1889 2½
54	Gogebic L. Syn., I.	Wis.	5,000,00	200,000	25	....
55	Gold Cup, S.	Colo.	500,000	500,000	1	* ....
56	Golden Era, S.	Mon.	2 000,00	200,000	10	* ....
57	Gold Placer, G.	Colo.	5,000,00	200,000	25	229,314 Dec. 1886 .25
58	Gold Rock, G.	Cal.	1,000,00	500,000	2	* ....
59	Goodshaw, G.	Cal.	10,000,00	100,000	100	....
60	Grand Belt, C.	Tex.	12,000,00	120,000	100	....
61	Grand Duke.	Colo.	800,000	80,000	10	* ....
62	Great Romance, S.	U.S.C	1,000,00	500,000	2	* ....
63	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	* ....
64	Gregory Con., G.	Mon.	3,000,000	300,000	10	....
65	Harlem M. & M. Co., G.	Cal.	1 000,00	200,000	5	* ....
66	Head Cent. & Tr. & S.	Aris	10,000,000	100,000	100	....
67	Hector, G.	Cal.	1,500,00	300,000	5	45,000 Jan. 1889 .15
68	Highland, S.	Mich	35,000	35,000	1	* ....
69	Hollywood	Cal.	200,00	100,000	2	* ....
70	Hortense, S.	Colo.	2,000,000	200,000	10	* ....
71	Huron, C.	Mich	1,000,00	40,000	25	280,000 May 1887 3.0
72	Iron Gold & Silver, S.	N. M	2,000,000	200,000	10	* ....
73	Ironton, L.	Wis.	1,000,000	40,000	25	....
74	Iroquois, C.	Mich	1,250,000	50,000	25	....
75	J. D. Reymert.	Aris	10,000,000	100,000	100	....
76	Julia Cons., G. S.	Nev.	11,000,00	110,000	100	1,660,000 Jan. 1889 .10
77	Lacrosse, G.	Colo.	1,000,000	100,000	10	* ....
78	Lee Basin, S. L.	Colo.	5,000,000	500,000	10	* ....
79	Mayflower Gravel	Cal.	1,000,00	100,000	10	585,000 Mar. 1890 .50
80	Medina, S.	Mex.	250,000	250,000	1	* ....
81	Mexican, G. S.	Nev.	10,000,000	100,000	100	2,860,760 Dec. 1889 .25
82	Middle Bar, G.	Cal.	400,000	200,000	2	* ....
83	Mike & Starr, S. L.	Colo.	1,000,000	200,000	5	* ....
84	Mollie Gibson	Colo	2,000,00	1 100,000	2	* ....
85	Monitor, G.	Colo	100,000	100,000	1	* ....
86	Mutual Mg. & Sm.	W'sn	100,000	100,000	1	* ....
87	Natick, C.	Mich.	40,000	40,000	25	* ....
88	Neath, G.	Colo	1,000,00	100,000	10	....
89	Nevada Queen, S.	Nev	10,000,000	100,000	100	250,000 Oct. 1889 .25
90	New Germany, G.	N. S.	100,000	100,000	1	* ....
91	New Pittsburg, S. L.	Colo.	2,000,000	200,000	10	* ....
92	Nonmonwealth, S.	Nev.	10,000,000	100,000	100	60,000 Apl 1889 ....
93	North Standard, S.	Utah	10,000,00	100,000	100	30,000 Nov ....
94	Noonday.	Cal.	600,000	60,000	10	208,000 Dec 1881 .10
95	Oneida Chief, G.	Cal.	500,000	125,000	100	* ....
96	Oriental & Miller, S.	Nev.	10,000,000	400,000	25	* ....
97	Osceola, G.	Nev.	5,000,000	500,000	10	* ....
98	Overman, G. S.	Nev.	11,520,00	115,200	100	3,823,400 Dec. 1889 ....
99	Paras, S.	Utah	2,000,000	200,000	10	....
100	Peer, S.	Aris	10,000,000	100,000	100	155.00 Sept 1889 .10
101	Peerless, S.	Aris.	10,000,000	100,000	100	370,000 Mar. 1889 .25
102	Phenix	Aris	500,000	500,000	1	* ....
103	Phenix, G. S.	Ark.	5,000,00 0	200,000	25	* ....
104	Phenix Lead, S. L.	Colo.	100,000	100,000	1	* ....
105	Pilgrim, G.	Utah	600,000	600,000	2	* ....
106	Potosi, S.	Nev.	11,200,000	112,000	100	1,461,600 Sept 1889 .50
107	Proustite, S.	Idan	250,000	250,000	1	* ....
108	Puritan, S. G.	Colo.	1,500,000	150,000	10	* ....
109	Quincy	Colo.	3,000,000	300,000	10	* ....
110	Rappahannock, G. S.	Va.	250,000	250,000	1	* ....
111	Red Elephant, S.	Colo.	500,000	500,000	1	* ....
112	Ropes, S.	Mich	2,000,000	80,000	25	147,200 July 1887 .50
113	Russell, G.	N. C.	1,500,000	300,000	5	* ....
114	Sampson, G. S. L.	Utah	10,000,000	100,000	100	288,157 July 1885 1.00
115	San Sebastian, G.	San. S	1,600,000	320,000	5	* ....
116	Santa Fe, C.	N. M.	5,000,000	500,000	10	* ....
117	Santiago, G.	U.S.C	400,000	200,000	2	* ....
118	Security, G.	Colo.	10,000,000	1,000,000	10	* ....
119	Sheridan	N. M.	2,000,000	200,000	10	....

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Aug. 9. H.	Aug. 9. L.	Aug. 11. H.	Aug. 11. L.	Aug 12. H.	Aug 12. L.	Aug. 13. H.	Aug. 13. L.	Aug. 14 H.	Aug. 14 L.	Aug. 15. H.	Aug. 15. L.	SALES.
Ad ms	1.45	.....	....	....	....	.....	....	.....	....	.....	....	.....	.....
Alice, Mont.	....	.....	....	....	2.50	.....	....	....	2.55	2 50	....	....	.....
Argenta, Nev.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Belcher, Nev.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Bodie Cons., Cal.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Bos. & Mont., Mont.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Breece, Colo.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Bulwer, Cal	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Caledonia	....	.....	....	....	306¼	....	1.90	....	....	....	....	....	.....
Calumet & Hecla.	....	.....	....	....	....	.....	....	....	306¼	....	....	....	.....
Chrysolite	....	.....	....	....	....	.....	....	....	.35	....	....	....	.....
Colorado Central	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Confidence, Nev.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Cons. Cal. & Va., Nev.	3 85	3.80	5 90	....	2 00	....	3 65	3 40	3 50	....	....	....	.....
Crown Point, Nev.	2.60	.....	....	....	....	.....	....	....	....	....	....	....	.....
Deadwood, Dak	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Dunkin, Colo.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Eureka Con.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Excelsior, Cal	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Father de Smet	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Franklin	....	.....	....	....	....	.....	....	....	22 50	....	....	....	.....
Freeland, Colo.	.43	.42	.42	....	....	.....	....	....	.40	....	....	....	.....
Gould & Curry, Nev.	2 85	..	2.05	..	2.00	.....	1.85	....	....	....	....	....	.....
Hale & Norcross, Nev	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Holyoke	....	.....	....	....	.01	.03	....	....	....	....	....	....	.....
Homestake, Dak	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Horn-Silver Ut.	3.5	....	3 45	....	....	.....	....	....	3,45	....	....	....	.....
Ind pendence, Nev.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Iron Hill, Dak	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Kearsarge	....	.....	....	....	....	.....	.12	....	....	....	....	....	.....
Leadville C., Colo.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Little Chief, Colo.	....	.....	....	....	1 00	.....	.10	....	....	....	....	....	.....
Martin White, Nev.	....	.....	.50	....	....	.....	....	....	....	....	....	....	.....
Mono, Cal	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Navajo, Nev.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
N. Belle Isle, Nev.	....	.....	45.25	....	45 25	..	45.25	....	....	....	....	....	.....
Ontario, Ut.	....	.....	5.00	....	4.85	..	4.60	....	....	....	....	....	.....
Ophir, Nev.	5 13	....	....	....	....	.....	....	....	....	....	....	....	.....
Osceola, Mich	....	.....	....	....	5.00	.....	....	....	....	....	....	....	.....
Plymouth, Cal.	5 50	..	..	....	....	.....	....	....	....	....	....	....	.....
Quicksilver, Pref	41.00	....	....	....	....	.....	....	....	....	....	....	....	.....
" Com.	....	.....	....	....	....	.....	....	....	126¼	....	....	....	.....
Quincy, Mich.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Robinson Cons. Colo.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Savage, Nev.	....	.....	3.55	....	....	.....	....	....	....	....	....	....	.....
Sierra Nevada, Nev.	2.25	....	3.00	....	....	.....	....	....	....	....	....	....	.....
Silver Cord.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Silver Mg. of L. V.	....	.....	....	....	....	.....	....	....	....	....	....	....	.....
Small Hopes	....	.....	.9	....	....	.....	....	....	....	....	....	....	.....
Standard	....	.....	.68	....	.68	....	....	....	.70	....	....	....	.....
Stormont, Utah	....	.....	....	....	....	.....	.05	....	....	....	....	....	.....
Tamarack, Mich	....	.....	....	....	208¾	....	....	....	....	....	....	....	.....
Yellow Jacket, Nev	....	.....	3 30	....	3.15	....	....	....	....	....	....	....	.....

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Aug. 9. H.	Aug. 9. L.	Aug. 11. H.	Aug. 11. L.	Aug. 12 H.	Aug. 12 L.	Aug. 13 H.	Aug. 13 L.	Aug. 14 H.	Aug. 14 L.	Aug. 15 H.	Aug. 15 L.	SALES.
Alloues, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Alta, Nev.	1 15	....	1.25	.....	1.15	....	1.10	.....	1 10	....	....	....	.....
Andes, Nev.	.90	....	....	....	....	....	....	....	....	....	....	....	.....
Amador, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Astoria, Cal.	.01	....	.01	....	.01	....	....	....	.01	....	....	....	.....
Bechtel	....	....	....	....	....	....	....	....	....	....	....	....	.....
Best & Belcher, Nev.	3.20	....	....	....	3.15	....	....	....	....	....	....	....	.....
Bonanza King, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Brunswick, Cal.	.07	....	.07	....	.07	.06	.07	....	.08	.07	....	....	.....
Bullion, Nev.	3 50	....	....	....	....	....	....	....	2 90	....	....	....	.....
Butte & Bost, Mont.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Castle Creek, Id.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Chollar, Nev	2.70	....	....	....	3.60	....	....	....	....	....	....	....	.....
Col. & Beaver, Id.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Commonw. Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Comstock T., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
" bonds.	....	....	....	....	....	....	....	....	....	....	....	....	.....
" scrip	....	....	....	....	....	....	....	....	....	....	....	....	.....
Con. Imperial, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Denver City, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
El Cristo, Rep of Col	....	....	....	....	.75	.70	.76	.75	....	....	....	....	.....
Exchequer	....	....	....	....	....	....	....	....	....	....	....	....	.....
Huron, Mich.	....	....	....	....	7 24	....	....	....	7.25	....	....	....	.....
Julia, Nev.	.40	....	.40	....	.41	....	.40	....	.36	....	....	....	.....
Justice Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Kingst'n & Pemb'ke	....	....	....	....	....	....	....	....	....	....	....	....	.....
Kossuth	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lacrosse, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lee Basin, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mexican, Nev.	....	....	3 20	....	....	....	....	....	....	....	....	....	.....
Minn Iron Co., Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Monitor	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mutual Sm. & M. Co	1.55	....	1 00	....	1.55	....	1.55	....	1.60	....	....	....	.....
Nevada Queen, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
N. Com'nw'th, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Occidental, Nev.	....	....	.80	.75	.95	.8.	....	....	.95	.75	....	....	.....
Oriental & Mil., Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Overman, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Phœnix of Ariz.	1.20	1.15	1.10	....	1.20	1.15	1 20	....	1 20	1.10	....	....	.....
Potosi, Nev.	....	....	....	....	....	....	6.00	....	....	....	....	....	.....
Rappahann'k, Va	.67	....	.07	....	.07	....	07	....	.07	....	....	....	.....
Santa Fe, Aris	....	....	....	....	....	....	....	....	....	....	....	....	.....
Santiago, U. S. C.	....	....	....	....	....	....	....	....	....	....	....	....	.....
S. Sebastian	....	....	....	....	....	....	.38	....	.40	....	....	....	.....
Scorpion	.35	....	....	....	....	....	....	....	....	....	....	....	.....
Shoshone	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver Hill	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sullivan Con., Dak.	1.00	....	1 00	....	1 00	....	....	....	1.00	....	....	....	.....
Sutro Tunnel, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
" Trust Cert.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sutter Creek, Cal.	1 05	....	1 05	....	1.05	....	1.05	....	1 05	....	....	....	.....
Union Cons., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Utah, Nev.	.80	....	.76	....	.75	....	.68	....	.67	....	....	....	.....

* Ex. dividend. Dealt in at the New York Stock Ex. Unlisted securities sold. ‡Assessment paid. Total New York. §Assessment unpaid. ‖Omitted July 18. Dividend shares sold, . Non-dividend shares.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Aug 8.	Aug. 9.	Aug. 11.	Aug. 12.*	Aug. 13.	Aug. 14.	SALES.
Atlantic, Mich.	22 00	21.25	23 00, 22.50	24 00	23.00	24 00	23 00	....	....	1,100
Bodie, Cal.	....	.....	....	.....	....	.....	....	....	....	.....
Bonanza Developm't	....	.....	....	.....	....	.....	....	....	....	.....
Bost. & Mont., Mont.	58.75	58.00	59.25	59 00	59.50	58 50	....	....	59.50	57 75	59 50	58 50	3,910
Breece, Colo.	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Calumet & Hecla, Mich.	300	298	3 0	....	305	30.	....	....	307	3 4	300	295	228
Catalpa, Colo.	.38	....	....	....	.63	.35	....	....	....	....	....	....	750
Central, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Chrysolite, Colo	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Con. Cal. & Va., Nev.	....	.....	....	.....	....	.....	....	....	4 00	....	....	....	10
Dunkin, Colo.	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Eureka, Nev.	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Franklin, Mich.	24 25	24.00	24.50	24 00	25.25	25.00	....	....	25 00	24 0	24 25	....	2,175
Honorine, Utah	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Horn Silver, Ut h.	....	.....	....	.....	....	.....	....	....	3 63	....	....	....	20
Kearsarge	21.50	20.50	22.50	21.50	22.50	22.00	....	....	22.25	21 00	20 00	..	1,705
Little Chief, Colo	.35	.34	....	....	.3.	....	..	....	.24	....	....	....	1,600
Little Pittsburg, Colo.	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Moulton	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Napa, Cal.	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Ontario, Utah	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Osceola, Mich.	41 13	40.50	42.00	41 50	41 75	41.00	....	....	43.00	41.00	42 00	....	1,933
Pewabic, Mich.	....	....	....	.....	....	.....	....	....	....	....	....	....	.....
Quincy, Mich.	123	....	123	.....	....	.....	....	....	....	....	....	....	20
Ridge, Mich.	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Sierra Nev., Nev.	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Silver King	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Stormont, Utah	....	.....	....	.....	....	.....	....	....	....	....	....	....	.....
Tamarack, Mich.	209	207	209	208	210	208	....	....	208	207	206¼	....	15

NAME OF COMPANY.	Aug. 8.	Aug 9	Aug. 11.	Aug 12 *	Aug. 13.	Aug 14	SALES
Alloues, Mich.	9 00	8 75	9.13	9.00	9 38	9.00	....	....	9.00	8 00	9 00	8 75	8,527
Arnold, Mich.	1 85	1 50	....	....	....	....	....	....	....	....	1.85	1 75	200
Aztec, Mich.	....	....	....	....	3 5	....	....	....	....	....	....	....	300
Bowman S., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Butte & Bost., Mont.	19 00	18 25	19 25	....	19 75	19 13	....	....	21.00	19.50	....	....	1,918
Centennial, Mich.	30.50	30.00	32 50	31.00	32 00	31 50	....	....	31 00	....	31 00	30.00	7 0
Comstock, T., Nev.	.18	....	....	....	....	....	....	....	....	....	....	....	80
Copper Falls Mg	....	....	....	....	....	....	....	....	....	....	....	....	.....
Crescent, Colo.	....	....	....	....	.18	.15	....	....	.18	.16	....	....	1,800
Dana, Mich	....	....	....	....	....	....	....	....	.40	....	....	....	300
Don Enrique, N. M.	....	....	....	....	....	....	....	....	....	....	....	....	.....
El Cristo, S. A.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hanover, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Humboldt, Mich.	.58	.53	....	....	.55	....	....	....	....	....	....	....	600
Hungarian, Mich	.70	....	....	....	.55	....	....	....	50	....	....	....	300
Huron, Mich.	7 50	7 13	....	....	....	....	....	....	7 00	6 75	....	....	60
Mesnard, Mich.	....	....	....	....	....	....	....	....	.80	....	....	....	100
National, Mich.	2.00	....	....	....	....	....	....	....	....	....	2 00	....	650
Native, Mich.	.25	....	....	....	.24	....	....	....	.24	.22	....	....	500
Oriental & M., Nev.	....	....	....	....	.06	....	....	....	....	....	....	....	400
Phoenix	....	....	....	....	....	....	....	....	....	....	....	....	.....
Pontiac	....	....	....	....	.60	....	....	....	.58	.50	....	....	300
Rappahannock, Va	....	....	....	....	....	....	....	....	....	....	....	....	.....
Santa Fe, N. Mex.	.63	....	61	....	61	.58	....	....	....	....	....	....	1,800
Shoshone, Idaho	....	....	....	....	....	....	....	....	....	....	....	....	.....
South Side, Mich.	....	....	....	....	.67	....	....	....	....	....	....	....	200
Star	....	....	....	....	.38	....	....	....	....	....	....	....	100
Tecumseh Mg. Co.	4.50	....	....	....	....	....	....	....	....	....	....	....	100
Washington, Mich	.40	.38	....	....	....	....	....	....	.41	....	....	....	250

* Holiday.

Boston: Dividend shares sold, 13,601. Non-dividend shares sold, 21,045 Total Boston, 34,646.

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh'rs.	Aug. 9. H.	Aug. 9. L.	Aug. 11. H.	Aug. 11. L.	Aug. 12. H.	Aug. 12. L.	Aug. 13. H.	Aug. 13. L.	Aug. 14. H.	Aug. 14. L.	Aug. 15. H.	Aug. 15. L.	Sales.
American Coal.		....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Cambria Iron.		....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Cameron Coal & Iron Co		....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Ches. & O. RR.	100	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Chic. & Ind. Coal RR.	100	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Do. pref.	100	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Col., C. & I.	100	50¼	49¼	49¼	48½	51	50¼	50⅞	50⅛	50⅞	50	50⅞	.....	5,058
Col. & Hocking C. I.	100	30	28	29½	28¾	30¼	29¼	30	29¼	29¾	29⅛	29¾	29¼	7,750
Consolidation Coal.	100	....	.....	....	.....	....	.....	....	.....	....	.....	27½	.....	50
Del. & H. C.	100	164⅝	164¼	161	160¼	161	160	162	160¼	163	162½	164⅛	.....	2,591
D., L. & W. RR.	50	145½	143⅛	143½	142½	144¼	143¼	144¾	14 .¾	144⅞	144⅝	146⅛	144⅞	55,148
Hocking Valley	100	29	28½	28¾	28⅝	29	28¼	29¾	29¼	29¾	29⅜	30¼	30	5,300
Hunt. & Broad Top		....	.....	....	.....	....	.....	....	.....	20¼	.....	....	.....	100
Do. pref.		....	.....	....	.....	46½	.....	....	.....	46½	.....	....	.....	63
Illinois Coal & Coke Co.		....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Lehigh C. & N.	50	....	.....	....	.....	52	.....	51⅝	51½	....	.....	51¾	51⅝	358
Lehigh Valley RR.	50	....	.....	....	.....	52½	52¼	52⅜	.....	52⅜	.....	52⅝	52½	1,948
Lehigh & Wilkesb. Coal	100	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Mahoning Coal.	100	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Marshall Con. Coal.	100	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Maryland Coal		13½	.....	....	.....	....	.....	....	.....	....	.....	....	.....	200
Morris & Essex	100	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
New Central Coal.	50	....	.....	....	.....	....	10	....	.....	....	.....	....	.....	20
N. J. C. R.R.	100	122	.....	122	121	124	121	....	.....	123½	123	123½	.....	1,770
N. Y. & S. Coal	100	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
N. Y., Susq. & Western	100	7⅛	....	7½	7	....	.....	....	.....	....	.....	7⅝	.....	510
Do. pref.	100	....	.....	....	.....	....	.....	32	.....	....	.....	....	.....	100
N. Y. & Perry C. & I.	100	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Norfolk & Western R.R.	50	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Do. pref.	50	....	.....	60	59⅝	60¾	6 5⅝	....	.....	62	.....	....	.....	690
Penn. Coal.	50	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Penn. RR.	50	53⅛	53⅜	53⅜	53¼	53⅛	53¼	53⅜	.....	53⅛	53⅜	....	.....	3,080
*Ph. & R. RR.		43⅛	42½	42⅝	40⅝	42⅝	40½	42⅝	42	43⅝	42¼	44¼	43¼	**115,244
Sunday Creek Coal.		....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Do. pref.	100	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....
Tennessee C. & I. Co.		45¼	43	44½	42½	45¾	43¾	46¾	45	47½	45	46¼	46	4,750
Do. pref.		....	.....	96	.....	....	.....	....	.....	....	.....	....	.....	100
Westmoreland Coal.		....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....

**Sales in New York, 67,740; in Philadelphia, 47,504. Total sales, 203,880.

San Francisco Mining Stock Quotations.

COMPANY	CLOSING QUOTATIONS. Aug. 8	Aug. 9.	Aug. 11.	Aug. 12.	Aug 13.	Aug. 14.
Alpha	....	....	....	....	....	....
Alta	1.00	1.00	1.05	1.00	1.00	1.05
Belcher	....	....	....	....	....	....
Belle Isle	1.00	1.00	1.05	1.05	1.10	1.05
Best & Bel.	3.00	3.15	3.00	2.75	2.85	2.00
Bodie	1.15	1.10	1.10	1.10	.95	1.10
Bulwer	.20	.25	.25	.25	.25	.20
Challar	.60	2.65	2.50	2.45	2.50	....
C'n'weal'h	3.00	3 00	3.00	2.90	....	2.65
Con. C. & V	3.60	3 75	3.75	3.55	3 55	3.65
Con. Pac.	....	....	....	....	....	....
Crown Pt.	2.50	2. 5	2.50	2.25	2.40	2. 0
Eureka C.	....	3.75	....	....	....	....
Gould & C.	2.75	2.05	1.95	1.75	1.85	1.95
Grd. Prize.	....	....	....	....	....	....
Hale & N.	2.60	2.35	2.30	2.05	2.10	2.30
M. White.	....	....	....	....	....	....
Mexican	2.50	3.20	3.05	2.85	2.95	2.9.
Mono	....	.35	.3.	.35	.35	.35
Mt. Diablo	....	2.00	....	2.25	....	....
Navajo	.40	.....	.30	.25	.2 0	.10
Nev. Queen	60	.55	60	.60	.60	.60
N. Belle I.	1.00	.75	.....	1.00	1.05	1.00
Occidental.	....	....	....	....	....	....
Ophir.	4.90	5.00	4.70	4.45	4 50	4.60
Potosi.	5.63	5.88	5.75	5.63	5.63	5.63
Savage	3.20	3.30	3 40	3.30	3.40	3.65
Sierra Nev	2.75	2.80	2.60	2.45	2.55	2.60
Union Con	2.50	2.65	2.50	2.25	2.35	2 36
Utah	.65	65	.60	55	.60	.55
Yellow Jkt	3.10	3 25	3.05	2.85	2 95	3. 0

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid. L. H.	Asked. L. H.
Atlantic Coal	....	$1.50
Balt. & N. C	....	....
Big Vein Coal	....	....
Conrad Hill	....	10
Cons. Coal	....	....
Diamond Tunnel	28	....
George's Crk. C.	....	....
Lake Chrome	13	35
Maryland & Charlotte	....	....
North State	05	....
Silver Valley	45	50

Prices bid and asked, lowest and highest, during the week ending August 14.

Birmingham, Ala.

COMPANY.	Bid. L. H.	Asked. L. H.
Ala. Coal & I. Co.	....	$100
Ala Conn. C. & C. Co.	....	$23
Am. R. Mill Co.	$60	....
*Alice Furnace	$103	....
Anna Howe G. Mg. Co.	$⅞	$⅞
Bessmer Land.	$35	...
Bir. Mg.& Mg.	$55	....
Cahaba Coal Mg. Co.	....	$70
Camille Gold Mg. Co.	$½	....
De Bardeleben C. & I. Co.	....	$76
Decat. L. Imp.	$14	....
DecaturMin.L.	....	$22¾
Ensley Land	....	$10½
*Eureka	**$99	$102½
Florence L. & Mg. Co.	$23	$28
Gadsen Land	$5⅞	$6¼
Hecla Coal Co.	$10	....
Hen. S. & M.Co	$75	....
Jagger-Town'ly C. & C. Co.	$8½	$10
Mag-Ellen	$100	....
Mary Lee C. & R. Co.	$20	....
Sheffield C. & I. Co.	$50	....
Sloss I. & S.	$44	....
†Sloss I. & S.	$106	....
††Sloss I. & S.	....	$69@$70
Tuscaloose C. I. & L. Co	$24	$27
Tenn.C. & I. Co.	....	$45½
" pref.	$100	$105
Vulcan C. & C. Co.	$5	....
Woodstock I.Co.	$24@$25	$31@$35

Prices, highest and lowest, bid and asked during week ending August 11.

* Bonds. † First mortgage. †† Second mortgage. ** Without interest.

Pittsburg, Pa. Aug. 13.

COMPANY.	B.	A.	Closing
Allegheny Gas Co.	....	....	....
Bridgewater Gas Co.	$58.00	@$58.63	$58.63
Chartiers Val. Gas	....	....	....
Columbia Oil Co.	*1.50	*4.50	*2.75
Consolidated Gas Co.	....	....	....
East End E. Light Co.	....	....	....
East End Gas Co	....	....	....
Forest Oil	....	....	....
Hazlewood Oil Co.	....	....	....
La Noria Mining	.17	.19	.17
Luster Mg. Co.	*20.00	*25.00	*23.75
Manuf'turers Gas Co.	....	....	....
Nat. Gas Co. of W. Va	....	....	....
N. Y.& Clev. Gas Coal.	31.50	....	31.50
Ohio Valley Gas	16.00	28.00	16.00
Mansfield C. & C. Co.	....	....	....
Pennsylvania Gas	14.00	....	14.00
People's Natural Gas.	....	....	....
People's N. G. & P. Co.	*15.25	*16.25	*15.88
Philadelphia Co.	*31.13	*31.75	*31.25
Pine Run Gas Co.	47.00	@48.00	48.00
Pittsburg Gas	....	....	....
Silverton Mg. Co.	....	....	....
South Side Gas	....	....	....
Tuna Oil Co.	....	....	....
Union Gas	....	....	....
Washington Oil Co.	....	....	....
W'house Brake Co	66.00	....	66.00
W'house A. B. Co.	116.90	@116.75	116.50
W'house E. Light.	*38.00	*39.75	*38.88
W'moreland & Camb.	....	....	....
Wheeling Gas	....	....	....
Yankee Girl Mg	....	....	....

* Actual selling price.

Prices bid and asked and sales during week ending August 13:

Columbia Oil Co.	20 shs.	$23¾@$27½
Luster Mining	45 "	@$24
People'sU.G.&P.Co.	212 "	$15¾@$16
Philadelphia Co.	15 "	$31¼@$31½
West. Electric	145 "	$38⅞@$39¼

St. Louis. Aug. 13.

CLOSING PRICES.

COMPANY.	Bid.	Asked.
Adams, Colo.	$1.05	....
American & Nettie	1.77½	$1.87½
Aztec, N.Mex.	.05	....
Bi-Metallic	....	....
Central Silver	.16¼	.17½
Cleveland, Colo.	....	....
Cleveland & An'r.	....	....
Cœur d'Alene	....	....
Elizabeth	1.92½	1.95
Gold King	....	....
Granite Mountain, Mont.	46.50	....
I. X. L., Colo.	....	....
La Union	.09	.10
Little Albert	.42½	.50
Montrose Placer, Colo.	....	....
Major Budd, Mont.	....	....
Mexican Imp.	....	....
Mickey Breen.	1.12½	1.17½
Mountain Key	.55	.60
Pat Murphy, Colo.	.15	.16¼
Puzzle	.18¾	....
Richmond Hill.	.14	.15
Samoa	.01½	.01
Silver Age, Colo.	1.50	....
Small Hopes, Colo.	.81¼	....
Tourtelotte	.05½	.06
West Granite, Mont.	....	....
Wire Patch	.15	....
Yuma, Ariz.	.58¾	.60

Trust Stocks. Aug. 15.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.

Am. Cotton Oil. Tr. Repts.	$29⅜@$29¼	
Cattle Trust	14 @ 15½	
Distillers' & Cattle Feeders'.	45 @ 46	
Linseed Oil	50⅛@ 51⅛	
National Lead	20⅞@ 21	
Standard Oil	165 @169½	
Sugar Refineries.	82⅛@ 82⅝	

Sales at the New York Stock Exchange week ending Aug. 15:

	Sales.	Price H.	Price L.
*American Cotton Oil.	6,730	29¾	28¼
National Lead	19,325	21⅛	19¼
Sugar	90,057	83¾	80⅜

*Trust receipts.

Foreign Quotations.

London.

COMPANY.	Highest.	Lowest.
Almada, Mex.	1s. 3d.	9d.
Amador, Cal.	£15-16	£13-13
Appalachian, N. C.	6d.	3d.
Canadian Phos. Canada.	£⅛	£⅛
Carlisle, N. Mex	3s 6d.	3s.
Colorado, Colo.	£⅛	£⅛
Comstock, Utah	....	....
Cordova	....	....
Cons. Esmeralda, Nev.	2s. 3d.	1s. 9d.
Denver Gold, Colo.	9d.	3d.
Dickens Custer, Idaho.	1s. 3d.	9d.
East Arevalo, Idaho.	2s.	1s.
El Caliao, Venezuela	£1⅞	£1⅝
Elmore, Idaho	2s. 6d.	2s.
Empire, Mont	1s. 3d.	9d.
Garfield, Nev.	1s 6d.	6d.
Jay Hawk Mont	2s. 6d.	1s. 6d.
Josephine, Cal	1s. 6d.	1s.
Kohinoor, Colo.	2s. 3d	1s. 9d.
La Luz, Mex.	1s.	6d.
La Valera, Mexico	17s. 6d.	12s. 6d.
Montana Lt., Mont	2 s.	19s.
New California, Colo.	6s. 6d.	6s.
New Consolidated	9d.	3d.
New Eberhardt, Nev.	1s. 3d.	9d.
New Emma, S., Utan	3s. 9d.	3s. 3d.
New Flagstaff, Utah	3s. 6d.	3s.
Newfoundland, N. F	3s. 6d.	3s.
N. Gold Hill, N. C.	1s 3d.	9d.
New Guston, Colo.	£4¼	£4¼
New Hoover Hill, N. C.	1s. 3d.	9d.
Old Lout, Colo.	£13-16	£11-16
Palmarejo, Mex	15s 3d.	14s. 9d.
Pinos Altos, Mex	£ 1-16	£9-16
Pittsburg Cons., Nev.	£5-16	£¼
Richmond Con., Nev.	£1	£¾
Ruby&Dunderberg, Nev	1s.	9d.
Sam Christan, N. C.	1s.	6d.
Sierra Buttes, Cal.	4s.	3s.
" Plumas Eur.	£13-16	£11-16
Sonora Mex	1s.	6d.
United Mexican, Mex.	7s. 6d.	6s. 6d.
U. S. Placer, Colo.	1s. 6d.	1s.
Viola Lt., Idaho	1s. 6d.	1s.

Highest and lowest prices during the week ending August 2.

Paris. July 31.

	Francs.
Belmez, Spain	725.00
Callao, Venez.	56 75
Callao Bis, Venez.	6.50
East Oregon, Ore.	7.50
Forest Hill Divide, Cal.	100.00
Golden River, Cal	440.00
" " parts	65.00
Lexington, Mont.	132.00
" parts	4.00
Rio Tinto, Spain	586.25
Tharsis, Spain	146 25

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, ℔ 100 lbs.	$1.75@$2.00
Muriatic, 18°, ℔ 100 lbs.	1.00@1.50
Muriatic, 20° ℔ 100 lbs.	1.12½@1.75
Muriatic, 22° ℔ 100 lbs.	1.37½@2.00
Nitric, 36°, ℔ 100 lbs.	4.00@4.26
Nitric, 42°, ℔ 100 lbs.	6.00@6.25
Oxalic, ℔ 100 lbs.	6.50@10.50
Sulphuric, 60°, ℔ 100 lbs.	80@1.25
Sulphuric, 66°, ℔ 100 lbs.	1.00@1.75
Alkali—	
Refined, 48 p. c	@2¾
Refined, 58°	2¾@3
Alum—Lump, ℔ lb.	1¾
Ground, ℔ lb.	1⅞@2
Lump. ℔ ton, Liverpool	£4 17 6
Sulphate of Alumina, ℔ ton	£4 10
Aqua Ammonia—18°, ℔ lb.	4¾
20°, ℔ lb.	6
22°, ℔ lb.	6@7
26°, ℔ lb.	10@11
Ammonia—Sul., ℔ 100 lbs.	3.15
Carb., per lb.	7½@8½
Arsenic—White, powdered, ℔ lb.	3¼@3½
Red. ℔ lb.	5¾@6¾
White, at Plymouth, ℔ ton.	£12 2 6d.
Asbestos—Am., p. ton	$50@$300
Italian, p. ton, c. i. f. L'pool	£18@£60
Asphaltum—P. ton	13.00
Prime Cuban, ℔ lb.	4½@5½c
Hard Cuban, ℔ ton	$28.00
Trinidad, refined, ℔ ton	$30.00
Barytes—Sulph., Am. prime white	17@20
Sulph., foreign, floated, p. ton	19½@21.50
Sulph., off color, p. ton	11.50@14.00
Carb., lump, f.o.b. L'pool, ton	£6
No. 1, casks, Rancorn "	£4 10 0
No 2, bags, Runcorn "	3 15 0
Bleach—Over 35 p.c., ℔ lb.	2@2½
Borax—Refined, ℔ lb.	9½@9⅝
Concentrated	7¾@8⅝
Refined at Liverpool, ℔ ton	£29
Brimstone—*See Sulphur.*	
Bromine—℔ lb.	37@38
Chalk—℔ ton	1.75
Precipitated, ℔ lb.	4¾@5
China Clay—English, ℔ ton	13.50@18.50
Southern, ℔ ton	13.50
Chrome Yellow—℔ lb.	10@25
Cobalt—Oxide, ℔ lb.	2.60@2.90
Copper—Sulph. English Wks, ton	£20@£21
Copperas—Common, ℔ 100 lbs.	70
Best, ℔ 100 lbs.	75@1.00
Liverpool, ℔ ton, in casks	£1 15s.
Cream of Tartar—Am. 99%	22½
Powdered, 99 p. c.	23
Emery—Grain, ℔ lb.	4½@5
Flour, ℔ lb	2¾@3½
Feldspar—Ground, ℔ ton	15.00
Fuller's Earth—Lump, ℔ bbl.	.90@.95
Powdered, ℔ lb.	1⅞@2
Gypsum—Calcined, ℔ bbl.	1.25@1.50
Iodine—Resublimed	2.75
Kainit—℔ ton	$9.25@$9.75
Kaolin—*See China Clay.*	
Lead—Red, ℔ lb.	6¾@9
White, American, in oil, ℔ lb.	6¾@7¼
White, English, ℔ lb	8½@8¾
Acetate, or sugar of, white	12@13
Lime Acetate—Amer. Brown	.95@1.00
" Gray	1.75@1.87½
Litharge—Powdered, ℔ lb.	6½@6¾
English flake, ℔ lb.	9@9½
Magnesite—Greek, ℔ ton	20.00
Manganese—Crude, per unit	.23@.28
Oxide, ground, per lb	2½@6½
Mercuric-Chloride—(*Corrosive Sublimate*), ℔ lb.	70@72
Mineral Wool—℔ lb.	2
Mica—In sheets according to size, 1st quality, ℔ lb.	25@$6.00
Ochre—Yellow, "B. F.," ℔ ton, f.o.b. mill	30.00
"J. F. L. S.," ℔ lb. ex dock	2½
Phosphate Rock—S. Carolina, per ton f. o. b. Charleston	5.75@7.00
Ground, ex vessel New York	11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton	16.00
Phosphorus—℔ lb.	70@75
Plumbago—Ceylon, ℔ lb.	4@5
American, ℔ lb.	5@7
Potassium—Cyanide, ℔ lb.	39@40
Bromide, ℔ lb.	33
Chlorate, ℔ lb.	13@10
Carb. ℔ lb.	4.70@5.54
Caustic, ℔ lb.	7½@8
Iodide	2.65@2.70
Muriate, ℔ 100 lbs.	1.77½@1.80
Nitrate, refined, ℔ lb.	6@8
Bichromate, ℔ lb	10½@11
Sulphate, ℔ 100 lbs.	2.30@2.35
Yellow Prussiate, ℔ lb.	17½@18
Red Prussiate, ℔ lb.	42@45
Pumice Stone—Select lumps, lb.	3¼
Original cks., ℔ lb.	1¾@2
Powdered, pure, ℔ lb.	2¼@2½
Pyrites—Non-cupreous, p. units	10d
Quartz—Ground, ℔ ton.	14.00@16.00
Rotten Stone—Powdered, ℔ lb.	3¼@3½
Lump, ℔ lb.	6@10
Salt—Liverpool, ground ℔ sack.	75@80
Turk's Island, ℔ bush.	25@28
Salt Cake—℔ lb.	60@62½
Saltpeter—Crude, ℔ lb.	5¼@5¾
Refined, ℔ lb.	6@8
Soda Ash—Carb., 48 ℔ 100 lb.	2¾
Caustic, 48 ℔	2¼@2½
Soda Caustic, 60%	3.25@3.35
" 70%	3.00
" 74–6%	2¾
Sal, English, ℔ 100 lbs.	1½@1⅝
Sal, American, ℔ 100 lbs.	.90
Nitrate, 100 lbs.	1.70
Strontium—Nitrate ℔ lb.	9@9½
Sulphur—Roll, ℔ lb.	1¾
Flour, ℔ lb.	2@
Crude Brimstone, 2s., ℔ ton.	19.00@19.29
Crude Brimstone, 3ds, ℔ ton.	18.50@18.70
Talc—Ground French, ℔ lb.	1¼@1½
Domestic, ℔ ton	$18@$20
c. i. f. Liverpool, ℔ ton	£4 5
Vermillion—American, ℔ lb.	61
English, ℔ lb.	82@85
Vitriol—(Blue), Ordinary, ℔ lb.	5½@5¾
Extra, ℔ lb.	7
Zinc Oxide—Am., Dry, ℔ lb.	4½
Antwerp, Red Seal, ℔ lb.	6@6½
Paris, Red Seal, ℔ lb.	6¼@7

* Spot.

THE RARER METALS.

Aluminum—(Metallic), ℔ lb.	$2.00@$2.50
Sheet, per lb.	2.50
Arsenic—(Metallic), per lb.	.40
Barium—(Metallic), per gram	$4.00
Bismuth—(Metallic), per lb.	2.75
Cadmium—(Metallic), per lb.	1.00
Calcium—(Metallic), per gram	10.00
Cerium—(Metallic), per gram	7.50
Chromium—(Metallic), per gram	1.00
Cobalt—(Metallic), per lb.	6.00
Didymium—(Metallic), per gram	9.00
Erbium—(Metallic), per gram	7.50
Gallium—(Metallic), per gram	140.00
Glucinum—(Metallic) per gram	12.00
Indium—(Metallic), per gram	9.00
Iridium—(Metallic), per oz.	7.00
Lanthanum—(Metallic), per gr.	10.00
Lithium—(Metallic), per gram	10.00
Magnesium—Per lb.	4.50
Manganese—Metallic, per lb.	1.10
Chem. pure, per oz.	10.00
Molybdenum—(Metallic), per gm.	.50
Niobium—(Metallic), per gram	5.00
Osmium—(Metallic), per oz.	65.00
Palladium—(Metallic), per oz.	35.00
Platinum—(Metallic), per oz.	15.00
Potassium—Metallic, per lb.	28.00
Rhodium—(Metallic), per gram.	5.00
Ruthenium—(Metallic), per gm.	5.50
Rubidium—(Metallic), per gram	2.00
Selenium—(Metallic), per oz.	1.80
Sodium—(Metallic) per lb.	2.50
Strontium (Metallic), per gm.	.60
Tantallum—(Metallic) per gram	9.00
Telurium—(Metallic) per lb.	5.00
Thallium—(Metallic) per gram.	.25
Titanium—(Metallic) per gram.	2.25
Thorium—(Metallic) per gram.	17.00
Tungsten—(Metallic) per oz.	2.25
Uranium—(Metallic), per lb.	5.00
Vanadium—(Metallic), per gm.	22.00
Yttrium—(Metallic), per gram.	9.00
Zirconium—(Metallic), per oz.	65.00

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000	3 00@3.25
Jerseys, ℔ 1,000	4.50@5 00
Up Rivers, ℔ 1000	5.00@5.50
Haverstraw seconds, ℔ 1000	5.25@5.50
Haverstraw firsts, ℔ 1,000	5.50@6.00
Fronts, nominal, ℔ 1000.	
Croton	14.00@16.00
Wilmington	20.00@21.00
Philadelphia	@22.00
Trenton	@22.00
Baltimore	
Building Stone—Amherst freestone, ℔ cu. ft.	95@1.00
Brownstone, ℔ cu. ft.	1.00@1.35
Granite, rough, ℔ cu.ft.	45@1.25
Granite, Scotch ℔ cu. ft.	1.00@1.15
Cement—Rosendale, ℔ bbl	.85@1.10
Portland, American, ℔ bbl.	2 15@2.45
Portland, foreign, ℔ bbl.	2.40@2.50
Portland, " special brands.	2.60@2.85
Roman, ℔ bbl.	2.75@2.90
Keene's coarse, ℔ bbl.	4.50@5.50
Keene's fine, ℔ bbl.	7.25@8.50
Slate—Purple and green roofing, ℔ 100 ft.	7.00@7.50
Red roofing, ℔ 100 sq. ft.	12.00
Black, roofing, ℔ 100 sq. ft.	4.25@5.50
Lime—Rockland, common ℔ bbl.	1.00
Rockland, finishing, ℔ bbl.	1.20
St. John, com. and finish, ℔ bbl.	.90@.95
Glens Falls, com. and fin., ℔ bbl.	.85@1.10
Labor—Ordinary, ℔ day	1.50@2.00
Masons, ℔ day	4.00
Plasterers, ℔ day	4.00
Carpenters, ℔ day	3.50
Plumbers, ℔ day	3.50
Painters, ℔ day	2.50@3.50
Stonesetters, ℔ day	3.50@4.00
Tilelayers, ℔ day	3.50@4.50
Bricklayers, ℔ day	4 00

THE ENGINEERING AND MINING JOURNAL will thank any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct any errors which may be found in these quotations.